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# LOCOMOTIVES AND CARS

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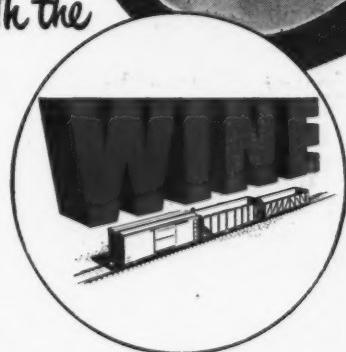
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And to the thousands who wanted to come, but had to stay on the job to keep the wheels rolling, you missed the greatest convention in the history of our industry. Better luck next time!

P.S. Just in case you didn't notice—23 out of 27 freight cars of all types at the Atlantic City Convention were equipped with Unit Trucks.

# **BUFFALO BRAKE BEAM COMPANY**

## **UNIT TRUCK CORPORATION**

August, 1953

VOLUME 127

No. 8

# RAILWAY LOCOMOTIVES AND CARS

Founded in 1832 as the American Rail-Road Journal.

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CONSTRUCTION COST	COST OF HEAVY REPAIRS		SERVICE LIFE OF CAR WITH HEAVY REPAIRS	CONSTRUCTION AND HEAVY REPAIR COSTS	AVERAGE COST PER YEAR
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Copper Bearing Steel \$5,500.00	\$2,220.00		30 Years	\$7,720.00	\$ 257.33
COR-TEN steel \$5,805.00		\$2,525.00	40 Years	\$8,330.00	\$ 208.25

Total Cost Per Car of Copper Bearing Steel..... \$7,720.00

Savings by use of COR-TEN steel (10 Years' additional service) .. 2,573.00

Additional Cost of COR-TEN steel..... 610.00

Net Saving Per Car over 40-Year Period..... \$1,963.00

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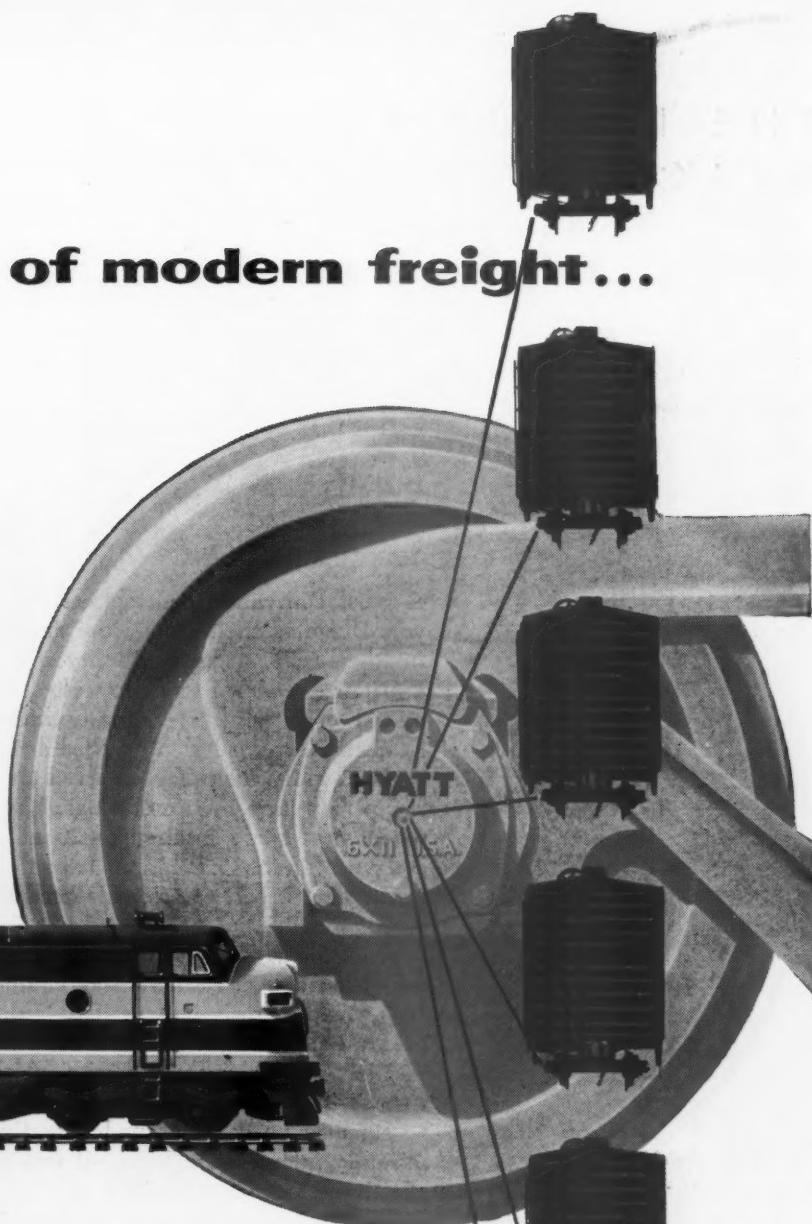
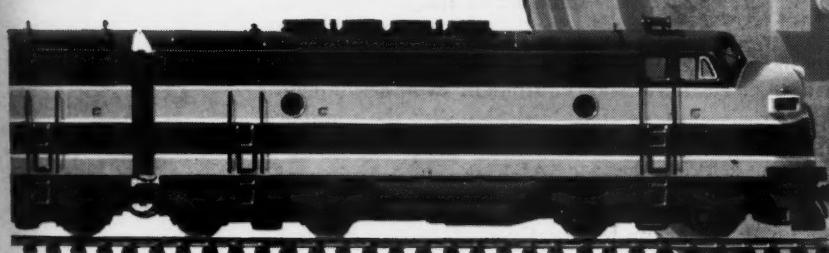
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First came the diesels. And now there's another sure sign of modern freight—at the journals of the newest freight cars. *It's the Hyatt name on journal box lids—meaning that a car is equipped with Hyatt Roller Bearings!* Standard equipment for years on thousands of passenger train cars and nearly 70% of all diesel road locomotives, Hyatt Roller Bearing Journal Boxes now make possible streamliner speeds for freight. Hyatt-equipped cars will start easier and roll more smoothly, with less jolting of merchandise. And they will keep pace with the fastest diesels—without the problem of hot box delays (caused by overheating of old-fashioned, friction type bearings). Watch for modern freight—powered by diesels and rolling on Hyatts!

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## THE EDITOR'S DESK

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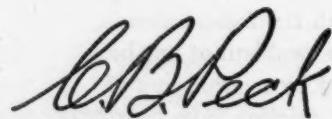
### Atlantic City

A great convention and a great exhibit! That is the universal expression heard by the members of this staff during the meetings at Atlantic City and since. The attendance, a matter of concern to all interested persons right up to the official opening, was eminently satisfactory, both in the number of railroad men enrolled and in the seriousness of purpose with which they observed and studied the exhibits. There may have been exceptions, but in the main it is apparent that this exhibition of 20 million dollars worth of equipment in the Convention Hall and on the tracks was well worth what it cost to assemble because of the concentrated attention and interest it excited.

From the visitors' viewpoint this was probably the best exhibition of American railway equipment ever assembled. This would scarcely be true if judged alone by the number of exhibitors. But when judged for the effectiveness of presentation and the ingenuity with which the functioning of various items of equipment was demonstrated—which may be summed up as all-around attractiveness to the persons seriously interested in them—it was outstanding. And the effectiveness of the exhibition as a whole was enhanced by the absence of exceptions to the height limitations specified for exhibits in the Convention Hall.

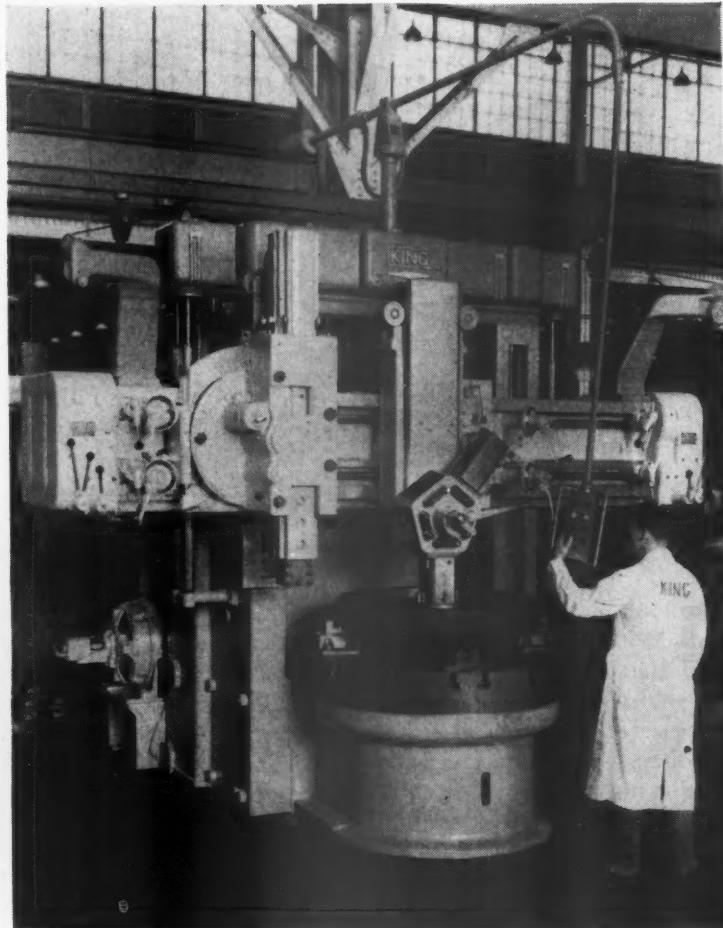
The meetings were notable for the number and for the variety of interests represented in them. The major meetings were those always associated with Atlantic City exhibits—those of the Mechanical and Purchases and Stores Divisions of the Association of American Railroads. But there were also the three-day meeting of the Electrical Section of the Mechanical and Engineering Divisions, a member meeting of the A.A.R., a member meeting of the American Short Line Railroad Association, and several sessions of the Pan American Railway Congress.

Such events, when held at intervals such that there are a goodly number of unexploited developments to be shown, are great time savers in advancing understanding of the significance of the new developments by those who will put them to work, if these men turn out in adequate numbers. This time they did.



**New 52" KING**, a modified-standard design for boring, facing and turning diesel locomotive wheels. Ten sizes available—30" to 144"—the widest size range among vertical mills.

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machines, of extra-rigid construction, capable of taking the heaviest cuts at the highest speeds modern cutting tools can handle. Investigate these "top profit" machine tools for your modernized maintenance program.

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# EDITORIALS

## The June Conventions

THE 1953 meeting of the Association of American Railroads, Mechanical Division, at Atlantic City brought forth many matters of interest to mechanical men in the railway industry. Aside from consideration of the extent and character of the technical reports which were presented and discussed at the meeting, it might first be in order to mention that the attendance at this year's meeting, while it did not exceed Mechanical Division registrations at some of the six meetings since 1926, for example, brought forth a greater attendance than last year. The most important thing in connection with the attendance was the fact that at practically every technical session the meeting room was filled to capacity. The members showed keen interest in many of the subjects before the Mechanical Division, some of which are quite controversial.

It may not be out of order to mention the fact that Chairman Cover did a good job of keeping the sessions from being dull. He was assisted in this to some extent by the fact that real progress was made this year in the campaign to have reports presented in abstract rather than to have them read in full. This shortened what has been a monotonous part of many previous meetings of this and other similar organizations. When a discussion period arrives the charman thus has a real opportunity to keep things moving rapidly and stimulate discussion on important subjects.

Among the things which Chairman Cover outlined in his remarks at the opening session was the research work of the Mechanical Division. He said that, with the new proposed laboratory facilities in Chicago, the Division is in a much better position than it has been for many years to contribute to progress in the study of materials and designs which the mechanical department utilizes in its work. Mr. Cover also touched upon a subject of paramount importance in the railroad field, not only to the mechanical department but to all other departments; that is, the necessity of recruiting and training young college men for service in the industry. He made a practical observation when, in his remarks to the Division, he said that "Railroads offer a tremendous opportunity to young engineers and, in spite of what some of our friends are doing to attract young engineers to other industry, we are definitely of the opinion that the primary urge must be with the individual and, if he is interested, our procedure is rather pleasant."

ANY comment concerning the Atlantic City meetings would be incomplete if mention were not made of the Railway Supply Manufacturers Association exhibit. There have been larger exhibitions than that assembled this year. More mechanical Division men have also been enrolled at earlier "big shows" than were enrolled this year. But no Atlantic City railroad exhibition of the past was superior to that staged this year in point of breadth of interest and skillful showmanship. And only one of the last six R.S.M.A. exhibitions, beginning with 1926, exceeded this one in total enrollment of railroad men. That was 1930 with 2,931, including Mechanical Division, Purchases and Stores Division, and railroad guests, as compared with 2,841 this year, including the two Divisions, the Electrical Section and railroad guests. The exhibition was a success, alike from the viewpoint of those who came to Atlantic City to study it and those who assembled the exhibits.

THE meeting of the Electrical Section held in Atlantic City, June 23-26, was its second as a unified body representing both the Engineering and Mechanical Divisions. Its first meeting was held in Chicago in September 1952 with those of the Coordinated Mechanical Associations. The Electrical Section will again meet with the Mechanical Division in Chicago in 1954 and in Montreal in 1955.

The shift in meeting dates and association affiliations is probably a good one since a primary function of the Electrical Section, like that of the Mechanical Division, is the preparation of standards and recommended practices. This situation involves a hazard, since the great care and associated responsibility needed to establish standards is apt to conflict with the necessary forward looking work which is the most important thing done.

This same fear was expressed ten years ago when the Association of Electrical Engineers, an independent organization, "went into the big house" and became the Electrical Section, Mechanical Division, A.A.R. That the fear expressed then was unfounded is made most evident by the splendid performance the Section showed this year. Added assurance of a bright future for the Section comes from the fact that it represents what within the railroad field is a young industry, still in process of rapid development and change.

# Mechanical Division Attendance Exceeded 1947 Meeting

*Atlantic City convention more than comes up to expectations, both as to railroad groups at the meetings and as to character and extent of the exhibits.*



H. T. Cover,  
Chairman

WITH a total attendance of 9,075, including 1,851 ladies, the joint meetings of the Association of American Railroads, Mechanical Division, Purchases and Stores Division and Electrical Section, not only exceeded expectations but brought out more railroad people than any one of the six meetings from 1926 to date. The technical sessions were held at Atlantic City in conjunction with the exhibit of the Railway Supply Manufacturers' Association, which exhibit filled the Convention Hall

exhibit space and included as well some 4,200 ft. of track exhibit at Bacharach boulevard and Ohio avenue. The estimated value of the entire exhibit was in the neighborhood of 20 million dollars. Some of the high spots of the exhibit are shown pictorially on pages 88 and 89 of this issue.

The opening session of the A.A.R., Mechanical Divisional meeting on Monday, convened following a general session over which C. W. Floyd Coffin, president, R.S.M.A., presided. The first technical session was called to order by the chairman, H. T. Cover, assistant vice-president—operation, and chief of motive power, Pennsylvania. During the sessions seven addresses were presented. These were by J. M. Symes, executive vice-president, Pennsylvania; J. H. Aydelott, vice-president, Operations and Maintenance Department, A.A.R.; W. J. Patterson, member, Interstate Commerce Commission; E. A. Londahl, traffic manager, Farm Equipment Institute; William White, president of the New York Central; V. M. Dawson, chairman of the Purchases and Stores Division and assistant purchasing agent of the Baltimore & Ohio, and H. T. Cover, chairman of the Mechanical

#### COMPARATIVE ATTENDANCE FIGURES FOR SIX ATLANTIC CITY CONVENTIONS

	1926	1928	1930	1937	1947	1953
R. S. M. A. men.....	3,122	2,644	2,531	2,699	3,879	3,589
Mechanical Division....	1,410	1,525	1,574	1,436	761	1,270
Purchases & Stores....	480	493	538	335	400	670
Electrical.....	...	...	...	...	...	218
Guests (Railroad).....	875	688	819	803	508	683
Guests (Others).....	1,916	2,067	1,763	1,563	1,679	1,851
Ladies.....	7,803	7,750	7,463	6,914	7,327	9,075



The new A.A.R. Mechanical Research Laboratory while under construction at Chicago.

#### ELECTION OF MEMBERS OF THE GENERAL COMMITTEE

The following members were elected to the general committee to serve until June, 1955: F. K. Mitchell, assistant vice-president, equipment, NYC; A. G. Kann, general superintendent equipment, IC; J. L. Robson, general superintendent motive power, GN; B. M. Brown, general superintendent motive power, SP; to succeed W. A. Newman, deceased: A. C. Melanson, chief of motive power and car equipment, Canadian National. In addition, C. E. Pond, general superintendent motive power, N&W, was elected to serve out the term, expiring June, 1954, left vacant by the retirement of the late R. G. Henley.

The terms of the chairman, H. T. Cover, assistant vice-president and chief of motive power, Pennsylvania, and the vice chairman, D. S. Neuhart, general superintendent motive power and machinery, Union Pacific, do not expire until June, 1954.

Division. These addresses are summarized and appear on the pages immediately following.

The program, in addition to the aforementioned addresses, included 17 technical reports which were presented and discussed during the sessions. All of these reports were accepted by the membership with certain items in several of the reports being submitted, as recommended by the committees, to letter ballot action.

#### Car Construction

After the Car Construction Committee in 1952 recommended a maximum height of 84 in. for the center of gravity of a car the committee was asked to approve a covered hopper car design based on an 87 in. height of center of gravity when the car is loaded. Tilt tests of this car at the Pennsylvania's Altoona Works will be made as soon as the shipper and the builder make a loaded car available to determine the accuracy of the center of gravity calculations before giving approval of the design.

#### Passenger Car Outline

The committee recommends, as a letter ballot item, that Plate P entitled "Passenger Equipment Diagram Unrestricted for Interchange Service," be modified by reducing the height above rail for car body width of 5 ft. 10 in. from 8½ in. to 8 in. to afford

some relief for generator design. Although it was desired to increase the over-all clearance width from 10 ft. 2½ in. to 10 ft. 6 in. for a distance above rail from 7 ft. 2 in. to 11 ft. 10 in. one road still has a main line tunnel that makes it necessary to maintain this width as specified on Plate P.

#### Auto Loader Repair

To meet a demand for concise and complete instructions for the maintenance and repair of the Evans auto loader the Evans Products Company have prepared a revised pamphlet after collaborating with the committee. This pamphlet will be available on request from the Evans Products Company.

#### Fire-Resistant Insulations

Because of fires primarily due to the types of insulating materials used the 1951 report recommended that specifications for standard freight refrigerator cars be modified to specify that insulation used must be such that it will not support combustion. Member roads cast a large number of negative votes on this recommendation and accordingly the proposition was referred back to the committee. The Mechanical Research Department conducted extensive tests which indicated that glass fibers, asbestos fibers and Alfol are the insulations that are completely fire-proof and will not burn. Seven insulations tested and nine not tested fall in this classification. Six insulations tested will burn when a flame is applied but will not support combustion when

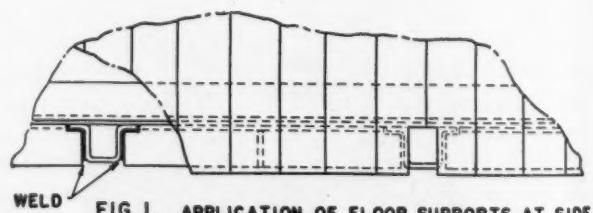


FIG. 1. APPLICATION OF FLOOR SUPPORTS AT SIDE SILL TO CARS NOT SO EQUIPPED.

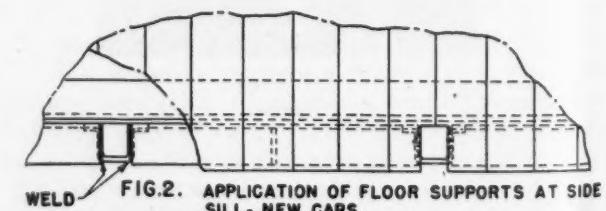
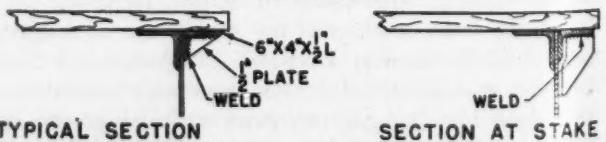


FIG. 2. APPLICATION OF FLOOR SUPPORTS AT SIDE SILL - NEW CARS.



TYPICAL SECTION AT REINFORCEMENT

SECTION AT STAKE POCKET

IN NO CASE SHOULD THE FLOOR BOARDS EXTEND MORE THAN 1" BEYOND THEIR SUPPORTS.

Wood decking for flat cars.



D. S. Neuhart,  
Vice-Chairman



V. R. Hawthorne,  
Executive Vice-Chairman



Fred Peronto,  
Secretary



W. M. Keller,  
Director of Mechanical Research

the flame is removed and therefore can be considered fire-resistant. Other insulations did not support combustion after being treated with a fire-inhibiting chemical. However, these inhibiting agents are water soluble and would probably lose their fire-retarding value after repeated wetting and drying. Therefore, there are 22 known insulations that would meet requirements that insulations be fire-resistant. The Committee recommended that Manual Plate C-2, Specifications for Standard Freight Refrigerator Cars, be modified by the addition of the following to Item 9—Insulation: "Insulation, not including the enveloping material, must be fire-resistant." If approved recommendation will then be made to the Arbitration Committee that the requirements be included

in the Interchange Rules specifying that refrigerator cars or refrigerator express cars built new; on or after a date to be established, must meet this specification, the same to apply to existing cars when it is necessary to renew insulation.

#### Mounting of Control Devices

The committee recommended as a letter ballot item that designs for mounting control devices on journal boxes be changed as shown on three drawings included with the report which would be substituted for Manual Pages D-4C, D-4B and D-4D, respectively. A change to Page B-3 consisted only of the deletion of

(Continued on next page)

## Control of Employees Who Are "On Their Own"

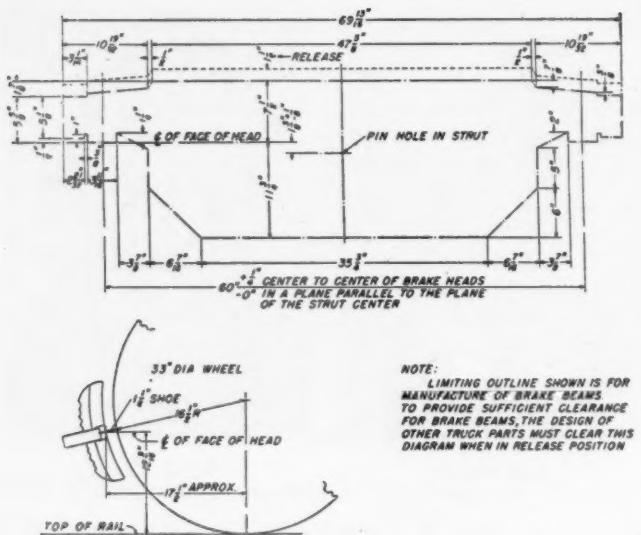
By J. N. Symes

More than three billion dollars per year is being spent by the railroad industry, largely under the direct supervision of you as chief mechanical officers. You have a tremendous responsibility in efficiently and economically supervising expenditures of that kind of money. If activities were concentrated and stationary, as is so in most industry, it would not be too difficult a task to keep in close contact and exercise very close control over these expenditures. But the expenditures in the maintenance-of-equipment department for the railroad industry are scattered over some 250,000 miles of territory. For the most part, the money you spend is in mobile equipment that is constantly on the move over your individual railroad and, in the case of freight cars and some passenger cars, over the entire country. This means that you should have an adequate and simple system of cost accounting so you will know at all times just what you are getting in the way of output for the dollars being spent. I have many reasons for believing that you are somewhat weak in that respect. My qualifications are merely those of an executive officer of a railroad who sees a crying need for better accounting reports as tools to help the mechanical officer in his day-to-day job. By better account reports is meant "accounts for non-accountants," not "accounts for accountants."

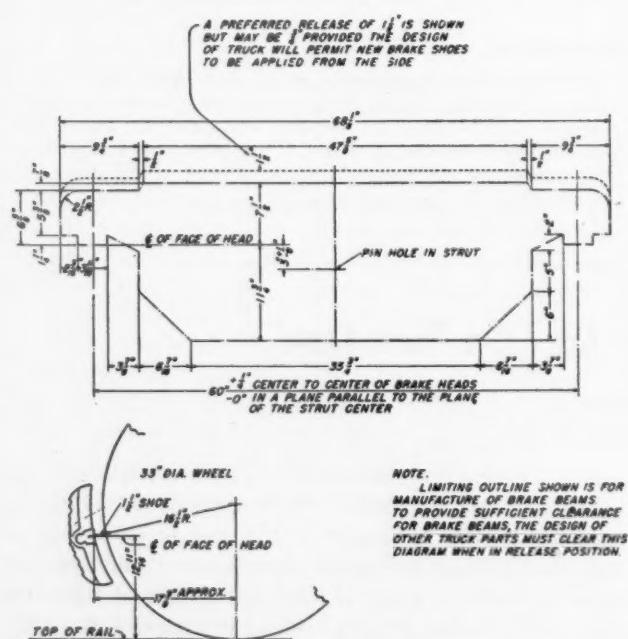
The number of man-hours consumed in the railroad industry, without direct supervision, represents a large percentage of the total man-hours worked. In other

words, we have large numbers of employees who are "on their own," so to speak. Such individuals should be required to make a report at the end of each tour of duty that will not only show their bosses (sometimes far removed from the point of work performance) what was accomplished, but be the kind of report that the individual will understand and really be proud to turn in each day. That, of course, means "job interest" and a major challenge to front line supervision in bringing it about.

Cars require repairs because of many conditions—use, commodity loading, switching, age, modernization, and things of that kind. But how many of you know how much it really costs to repair a car, divided as between the various classes of equipment and as between the different age groups of equipment? Many of you are fooled because these charges are pooled. You simply can't pool a lot of different things and produce a correct answer for any of them. In the past, probably the cost of maintaining information such as I am suggesting was prohibitive. But as you now see the many mechanical and electronic methods of records being kept, maybe you mechanical officers should reappraise the field in the light of present-day conditions to determine whether or not much of the information you would like to have had in the past and were prevented from obtaining because of prohibitive costs might not now be made really available at costs that could be fully justified from the results attained.



Limiting outline for Unit-type brake beams.



Limiting outline for hanger-type brake beams.

the "No Go" tolerance table for the spline drive shaft. The changes are recommended because of improvements in the design of axle-driven devices—and the introduction of scientific instruments for use in the inspection of axles for defects.

#### Brake Beam Clearance

The committee recommends as a letter ballot item changes on Manual Pages E-85 and E-86 to show the brake beam diagram location relative to center of wheel and above rail in applied and release position as shown on the accompanying drawings. This action was taken because truck side frame manufacturers advised that the use of a 2-in. thick brake shoe moves the clearance outline  $\frac{1}{2}$  in. closer to the center of the truck, seriously affecting clearances and in some cases requiring the truck frames to be redesigned. This condition is particularly true of trucks with long spring travel using the Unit brake-beam suspension system.

#### Truck Side Frames

During the past year 19 additional designs of truck side frames

and 15 additional designs of truck bolsters were approved. There are 31 side frame and 12 bolster applications for A.A.R. approval being held awaiting further action by the applicants. Failure of side frames in service and the resulting damage could be reduced if member roads would report failures to the secretary giving manufacturer's name, pattern number, date cast and date of failure. Patterns causing the greatest amount of trouble could then be removed from service and scrapped. Tests made to satisfy a member road gave results which indicate that side frames initially selected for design tests and approval adequately represent results that may be expected from production run side frames.

#### Journal-Box Hinge Lug

The committee reviewed the improved design of journal-box hinge lug contour developed by the Symington-Gould Corporation to provide easier lid closing. It recommended as a letter ballot item that the improved hinge lug contour without wear plate and bushing shown in an accompanying drawing be adopted as standard and the hinge lug contour with wear plate and bushing be adopted as alternate standard to supersede the designs shown on Manual Pages D-15 and D-15 A.

#### Anti-Waste Roll Journal Box

The Hogan anti-waste roll journal box has been applied to some New Haven box, flat and hopper cars, some of which have been in service for about five years. The committee has prepared Page D-15B showing the Hogan anti-waste roll ledge incorporated in the design dimensions for integral journal boxes as an approved equivalent to recommended practice and recommends that it be submitted to letter ballot for approval.

#### Reclaiming Journal Bearing Wedges

The committee recommended as a letter ballot item that journal bearing wedges may be reclaimed by machining or grinding provided the original top contour is restored, the nominal thickness of crown is not reduced more than  $\frac{3}{32}$  in. and the length over contact surfaces is restored if reduced more than  $\frac{1}{16}$  in. If adopted this action would modify Manual Pages L-3 to L-8 F and Interchange Rule 23. Wedges thus reclaimed would be classified secondhand.

#### Brake Beam Tests

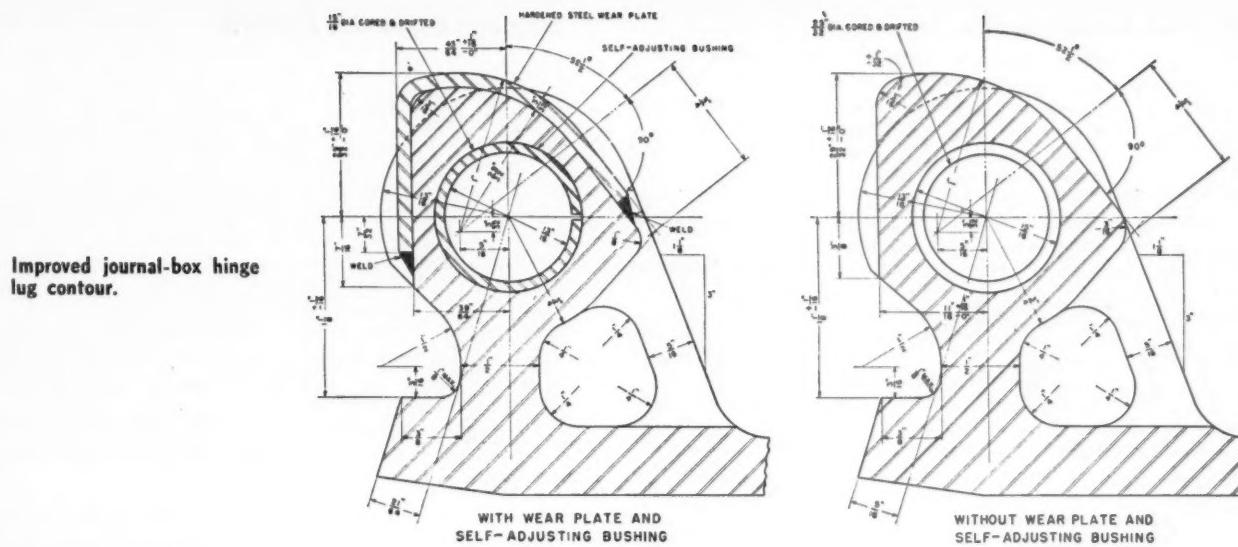
The committee considered the expense of keeping records on original test brake beams not justifiable and recommended that the reports be discontinued. It also did not authorize service tests of new brake beams before granting conditional approval because the committee has sufficient data to evaluate laboratory tests so that brake beams may be safely given conditional approval. The committee pointed out that Par. 18 of the brake beam specifications requires that beams receive a conditional certificate until they have passed a trial service period. Therefore, new beams after first passing laboratory tests will be given only a conditional certificate. The committee recommended as a letter ballot item Section A-16 of the brake beam specifications, Manual Pages E-84 and E-84 A, be modified by the addition of a new item: "7. Arranged for use of three or four point support." Tests are being made of two new designs of approved equivalent brake beam safety supports.

#### Duryea Underframe Repairs

Drawings have been prepared by the Hulson Company and reviewed by the committee which cover repairs to older cars with Duryea Cushion Underframes that have been causing trouble. These cars were built before the Hulson Company acquired this underframe. The committee agreed that a circular letter should be prepared to cover the methods of repair, copies of which will be sent to car owners after it has been approved by the committee.

#### Center-Sill Welding

To conform with accepted practice Page C-6, 1945, on Z-type center sills was authorized to be revised editorially to read "Continuous electric weld 30 per cent penetration except for a distance of four feet at each bolster to have approximately 100 per cent penetration."



## **Interference of Train Line Angle Cocks**

A special subcommittee investigated interference of angle cocks on certain passenger equipment with long shank tight lock couplers. The angle cocks in some cases are so located that the handles come in contact with the bottom crossmember of the buffer pocket. The subcommittee found that moving the angle cock 10 in. backward longitudinally toward the transverse center of the car will, in most cases, eliminate the interference. Revisions to Manual Page E-76 A have been prepared but the revisions in final form were too late to be included in this report. The subcommittee intends to continue investigation of this subject even after revised Manual Page E-76 A is issued to determine whether additional improvements can be made.

#### Nailing Strips

Two designs of alternate standard door post construction were recommended submitted to letter ballot to avoid splitting of the car lining for 10 in. either side of the door opening when paper grain doors are applied with heavy nails. Drawings of these two designs were included in the report. Some roads have applied 1½ in. or 1¾ in. vertical strips on each side of the door opening to take care of this situation.

## Lumber Grading

A modification to Section 7, Page 6 of Specifications M-907-41-Car Lumber was recommended as a letter ballot item to more clearly define what is expected of the various grades of lumber.

### **Flat Car Decking**

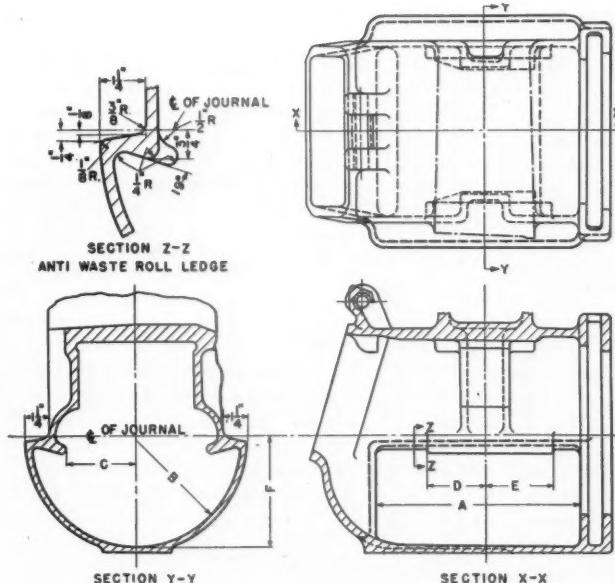
Because of unsatisfactory floors on wood deck flat cars the committee recommended that square edge boards of treated lumber (tongue and groove lumber prevents drainage) be used for decking and where the boards project more than one inch beyond the side sills that they be supported. A drawing showing this support was included with the report.

## **Welding Running Boards**

To cover the welding of metal running boards the committee recommended as a letter ballot item certain modifications to fusion welding and bronze welding limits and regulations shown in Section L of the Manual and Interchange Rule 23. These proposed modifications give the conditions under which the welding of metal running boards, brake steps, dome steps and dome platforms is and is not permitted.

### **Welding Brake Rods**

Tests made by members of the committee indicated that it is satisfactory to weld forged brake rod jaws and eyes to rods by arc welding if the welding is performed correctly. The committee recommended as a letter ballot item that fusion welding and



CLASS OF BOX	SIZE OF JOURNAL	A	B	C	D	E	F
C	5 X 9	9 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3"	3 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
D	5 $\frac{1}{2}$ X 10	10 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	4"	5 $\frac{1}{2}$ "
E	6 X 11	11 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4"	4 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
F	6 $\frac{1}{2}$ X 12	12 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	5"	6 $\frac{1}{2}$ "

#### **Integral journal box with anti-waste roll ledge.**

bronze welding limits and regulations shown in Section L of Manual and in Interchange Rule 23 be amended by the addition of drawings showing how to perform this welding operation. These drawings were included with the report.

#### **Location of Placard Boards**

The Bureau of Explosives has removed the height limitation on the location of placard boards (hitherto not less than 4 ft. 6 in. from floor of car to bottom of board). In the interest of safety and convenience of placard application the committee recommended as a letter ballot item that the distance from the floor line to the bottom of the board should not exceed 2 ft. 6 in. for end board and 22 in. for side boards. The report listed the changes involved in detail and also pointed out that the changes would affect at least 500,000 cars. The committee therefore recommended that the changes be made on existing cars as they through shons for Class I general repairs.

### Allied Full Cushion Trucks

Because of failures and the difficulties in detecting defects the committee recommended as a letter ballot item that cars equipped with Allied full cushion trucks be prohibited in passenger car service on and after January 1, 1955.

### Car Designations

The recommendation was made as a letter ballot item that the definitions and designating letters for refrigerator cars be modified by the addition: "RPM"—Mechanical refrigerator, similar to "RP" but equipped with beef rails. Also, that the designation "LOC" be eliminated because cars of this type are now designated "LO" by car owners and the following designation be added: "TPA"—Tank car equipped with aluminum container of ICC Specification 104A-AL-W.

### Box Car Infestation

Grain elevator and flour mill operators have complained that perforated plates in doorway areas, applied to prevent damage by heavy lift trucks when cars are loaded with other than grain or flour, lift up and permit grain to get under them. This grain, particularly wheat, sours and contaminates car and it is claimed the condition also causes weevil infestation. The committee believed that each railroad must consider own equipment because of differences in car construction and it recommended the following steps: a minimum of two longitudinal supports between side sill and center sill where 1½-in. or 2½-in. boards are used, preferably three supports with 1¾-in. boards; protector plates secured with bolts which pass through framing members if possible; plates joined together by continuous or skip welding, if skip welded, welds to be 6 in. in 12 in. but not less than 6 in. at ends of plates and 3 in. between pair of hold-down bolts adjacent to seam; floor boards to be of good quality, well seasoned and level; and underside of plates and top of wood floor coated with preservative paint or compound having sufficient body to seal joint between plates and floor and fill perforations in floor plates.

### Box Cars with Lading Anchors

Many thousands of box cars have been equipped with lading strap anchors. In order that cars so equipped may be readily identified by yard men the committee prepared a suggested symbol and indicated its location on the cars by a drawing accompanying the report. It recommended as a letter ballot item that this arrangement be adopted as recommended practice and included in Section L of the Manual.

The report was presented by a committee of which J. A. Gower, assistant mechanical engineer, PRR, was chairman.

### Discussion

Several members, speaking from the floor, thought the action of the committee in regards to the Allied truck was too drastic and not justified. As a result, Chairman Cover said that further study will be given to this item before submission to letter ballot. The committee recommendation that the Allied truck be prohibited was based on the road failures of these trucks and the difficulty of getting replacement parts because the truck is no longer manufactured.

A discussion of the use of low-alloy high-strength steel for car construction was presented by C. S. Patton, Jr., assistant superintendent motive power, car, Norfolk & Western. A high proportion of N&W cars are open-top and the road has not found a practicable protective coating. Tests of low-alloy high-strength steel show that it will produce an expected car service life of 20 to 24 years. In addition to its resistance to corrosion, he said this steel if uniform in thickness, lends itself to welding and takes a coating very well.

One member pointed out that there are too many A.A.R. approved side frames and suggested that they be standardized in some of the test work under way which included the modification 1¼ in. lining would also take care of the nailing problem in connection with the use of paper grain doors.

W. M. Keller, director of mechanical research, A.A.R., reviewed some of the test work under way which included the modification of journal bearing wedge contour, a study of the spring-plank problem, testing of brake-beam safety supports and lubrication.

### Axle and Crank Pin Research

The report on Axle and Crank Pin Research included the status of tests of passenger car axles with 5½ by 10 journals; fatigue tests on axles made to Specification M-126-49; experimental fatigue tests on axles quenched below the critical and on "as forged" axles.

The report also included the status of current assignment as follows: Broken and burned-off journals resulting from overheated bearings; Black collar axles having "as forged" body; Pittsburgh Steel tubular axle for all purposes; Tubular axle failures; Development of journal roller bearing assemblies; Protective surface coating for body portion of railway axles.

The report called attention to the closing of the docket on: Crank pin fatigue tests; Design and dimensions of axle centering holes, and Credit for removed axle having cylindrical center—Rule 101, Items 195 to 201.

The report was presented by a committee of which W. M. Keller, director mechanical research, Mechanical Division, A.A.R., was chairman.

### Discussion

Burned-off journals were said, from the floor, to cost the railroads 8.84 cents per 1,000 car-miles in 1948, according to one study, a figure which had jumped to 30.19 cents.

### Couplers and Draft Gears

The committee recommended that the following items be submitted to letter ballot:

Approval of a booklet, based on investigation of over 900 train partings, which describes and illustrates the condition of couplers and associated parts that contribute to train partings, and what the correct conditions are.

Revision of M-205 to cover all yokes for passenger as well as freight cars.

Adoption of the Y35A and the Y36 yokes as standard. The Y35 will be for existing cars only.

Adoption of the Type F interlocking coupler as an alternate standard.

Addition to the Manual and advancement to standard of the E24 single and the E25 double articulated rotary locklift assemblies, and removal from the Manual of rigid locklift assemblies E14A and E15A.

Adoption of the 1951 tentative specifications for rubber draft gears, which are now in final form.

Revision of the title of M-901 to exclude rubber draft gears and of the specifications to include 17½-in. and 18½-in. pocket gears, also amplification of the appendix to clarify tests after stated service intervals.

Prohibit the application of secondhand draft gears to foreign cars, permit the application of such gears in good condition to system cars only, and set up rules for disposing of defective secondhand gears removed from foreign cars.

### Acceptance of Coupler Yokes

The committee collaborated with the standard coupler manufacturers to draw up a new specification for the purchase and acceptance of A.A.R. approved cast steel coupler yokes for use with conventional and twin cushion rubber draft gears. This specification covers designs which have satisfactorily met the design test requirements of revised Specification M-205.

The committee proposed to continue both Grade B and Grade C steel as optional materials for Y40 and Y30 yokes, also for the Type F coupler yoke with conventional or twin cushion rubber gear, and the yokes for Type E swivel or rigid shank coupler with twin cushion gear. The same patterns will be used for the latter two to avoid carrying two sets of pattern equipment. Tests have shown that full strength is obtained in Grade B and it is recommended that Grade B be specified as one grade of steel which is expected to hold down cost. Reclamation work can be carried on with much less risk with Grade B. This specification is being progressed with the other committees concerned.

The committee also recommended to the arbitration committee that for all new cars, other than ore cars, built new after January 1, 1954, Interchange Rules 3 and 101 be revised to require standard 24½-in. pocket gears.

### Certified Draft Gears

Conditional certificates of approval have been issued for the following draft gears: Peerless Type D-A; The National Malleable & Steel Castings types MF-275, MF-260-1, and MF-275-1. The conditional certificate for the MF-260 and MF-260-1 authorizes the application of not to exceed a total of 6,000 gears, as do the certificates for the MF-275 and MF-275-1.

Waugh WM-4-6R and WM-4-6F. The conditional certificate authorizes application of not to exceed a total of 6,000 WM-4-6R or WM-4-6F gears.

The Hulson Type 202-A gear is still under conditional approval and will be checked later this year to determine its service record. A change in the manufacturing practice of the Waugh-Gould Type 420 gear was tested and approved.

At the request of National Malleable & Steel Castings, their Type M-50-B gear has been changed from approved to non-approved. The A.S.F. Quad, conditionally approved, has been withdrawn from test at the request of the manufacturer who has removed all gears of this type from service.

### Short Draft Gears for Cars

The following short draft gears for pocket lengths of 17½ in. and 18½ in. were tested and met the approval of the Subcommittee: Waugh-Gould Type 451; National Type MF-290; National Type MF-290-A; National Type MF-294; American Steel Foundries KC-6-K; American Steel Foundries KD-6-K.

The check tests of certified draft gears after 5, 12 and 16 years of service to establish a life yard stick for certified draft gears is being carried on and as soon as gears under this classification can be located, the tests will be started and carried to a conclusion and a report submitted.

A check of the WM-4-6 draft gear was made due to changes brought about by the change in yoke specification which caused a slight change in the construction of the rubber mats. These tests were made and approval was given by the committee.

An application has been received for a specification test of the Miner Class RF-333 draft gear which will be started as soon as specimens are available for selection.

The report was presented by a committee, of which C. K. Steins, mechanical engineer, PRR, was chairman.

### Discussion

In the discussion it was obvious that opinions were divided. One member cited the advantages of the Type F coupler which has now had the benefit of five years' experience and, according to this member, no disadvantages. He petitioned the membership for favorable action on the application of this type of coupler.

Another member, in speaking of free slack in draft gears, questioned the practicality of the method of determining free slack and pointed out that in the average repair yard the workman uses an 8-lb. sledge to move a 1,000-lb. assembly and that under such conditions the assembly could not be driven far enough to make the necessary adjustments. This member asked that consideration be given to a more practical method of checking free slack.

One member suggested that action taken to prevent the application of second-hand draft gears in other-than-system cars would be most expensive to the individual road for the reason that the scrap value of the gear removed might be only approximately two dollars whereas some of the gears were appraised at 75 per cent of their value. In taking such exception this member was referring to Section D of the original report.

(Continued on next page)

## Interdepartmental Team Work

By J. H. Aydelott

Our nation is known throughout the world for its high productive capacity. From experience we know that our industries, our mines and our farms can increase their production still further when an emergency requires it. This is equally true when the measure of productive capacity is applied to the railroad industry.

Whether at peace or at war, the railroads have been the primary transportation agency in America for many generations and they expect to continue in that status. Their ability to attain and to hold this position is due in no small measure to the fact that they are individually owned and operated and that they are highly competitive one with the other in areas jointly served. The railroads have a huge capacity to produce transportation, much of it unused in normal times.

The capacity of our railroad systems to produce transportation is not to be judged solely by the number of cars and locomotives owned. It is rather the efficiency with which this equipment is used. It is important, particularly when an emergency exists or the car supply becomes tight, that the number awaiting repairs be held to the absolute minimum. Research and development have produced a freight car of high construction standards. It will have a higher percentage of availability than the car of older design which it replaces.

The ability of our railroads to produce transportation at costs which are unequaled anywhere in the world has been due in large measure to the constant improvement which they have made in their locomotives and cars progressively through the years, particularly since the

turn of the century. Almost invariably each new type of locomotive procured was longer and heavier than that which it replaced or supplemented in the assignment. This required, in many cases, laying of a heavier rail section, that heavier bridging be provided and that the ballast used be of improved quality, and there were many other changes required in the fixed property.

The successful operation of a railroad requires the closest of relationships between the various departments. Awareness of the other fellow's problems and a wish to do something helpful about them is today exemplified in a proposal which I understand will come before your meeting that there be an interlocking of memberships on several important committees of the various divisions in our association. Under this plan, the committees of the Engineering Division, the Purchases and Stores Division, and the Mechanical Division will know what action is called for when an issue is raised and it can then be determined the extent to which the other divisions may be able to contribute to its solution.

The railroads have a much greater investment in the modern locomotive and in the modern freight car built or purchased today than in the old equipment retired, and it is essential that the productive capacity of this new equipment be increased to the greatest possible extent. Research is pointing the way to a lessening of the instance of service failures in locomotive and freight-car operation. It likely will suggest for the future the use of materials and designs which may outmode many which are deemed sufficient for today.

### TESTS OF CONTROLLED-SLACK COUPLER FOR PASSENGER SERVICE

Following a letter received from a voting member recommending that the controlled-slack coupler be made alternate standard for the Type H tightlock coupler for passenger cars, the General Committee reports its decision that official tests be made of the controlled-slack coupler, similar to those to which the Type H tightlock coupler was subjected in its development, before determining whether the controlled-slack coupler can be recommended as an alternate standard to the Type H coupler, except on Class B cars.

In the matter of "brake-in-two's" one member suggested that some of the difficulty could be attributed to the improper application of uncoupling rods and brackets and that if more attention was paid to the application of these parts some of the difficulty might be eliminated.

In concluding the discussion, Chairman C. K. Stein, mechanical engineer, Pennsylvania, called the attention of the membership to the fact that Rules 17 and 101 were drawn up to discourage the use of non-approved gears and added weight to the suggestion that second-hand gears be applied only to system cars.

### Loading Rules

The Committee on Loading Rules appreciates valued assistance given in the formulation of new and revised loading methods, both by shippers and the Department of Defense, which has resulted in improved and safer shipments in rail transportation.

The Supplement to the MD Pamphlets recently published contains a number of changes in the general rules; a revision of many of the present loading figures; and eleven new loading methods. These changes or additions have resulted from proposals submitted by both shippers and carriers, which have been handled and approved by the committee. Some of the many changes and additions to the MD Pamphlets include the following:

(1) Revision of the wording of General Rule 1 for clarification as a result of a conflicting arising on a member railroad as to the proper interpretation of the rule.

(2) Inclusion of a provision in General Rule 5 to cover the adequate securing of hinged, movable or detachable parts as a result of trouble experienced by the carriers. Also a modification of the rule covering the permissible loading of ingots, etc., on edge, with units wedged between themselves and car sides without side blocking as a result of favorable reports on test shipments.

(3) Inclusion of a provision in General Rule 9 to cover the permissible use of commercial size lumber for wood securement items, which will clarify a matter which has been troublesome to both shippers and carriers in the past.

(4) Modification of General Rule 10 to permit the use of southern pine larch and hemlock as permissible alternates for hardwood stakes.

(5) Revision of General Rule 15 to indicate the proper method of securing cables when specified; to restrict the substitution of common wire for those specified in the tables, namely numbers 7, 8, 9 and 11; to clarify the high tension band and high tension wire substitution provisions; and to include the requirement that points of attachment must be as strong as securement used.

(6) Revision of Figs. 30 and 35 of Pamphlet MD-1 covering bundled steel and coiled steel shipments to provide for alternate methods of loading as a result of favorable test shipments.

(7) Inclusion of the following new loading figures in Pamphlet MD-1, which have been submitted by shippers and favorably tested under experimental load cards: Fig. 8-A—Alternate method of loading beam steel flooring; Fig. 45-A—Method of loading mill rolls with short bodies; Figs. 71-A, 74-A and 77-A—Alternate methods of loading wire mesh.

(8) Revision of the majority of the pipe loading figures in Pamphlet MD-4 for clarification and of Fig. 28 to require the use of additional securement on shipments of mechanical joint cast iron pipe, which has resulted in more satisfactory shipments.

(9) Revision of the crane loading figures in Pamphlet MD-5 to include additional and alternate types of securement as a result of continued trouble experienced on shipments.

(10) Inclusion of the following new loading figures in Pamphlet MD-5, which have been submitted by shippers and approved: Fig. 8-A—Alternate method of loading tanks; Fig. 34-A—alternate method of loading rotary cranes with pneumatic tires; Fig. 66-A—method of loading uniform size boxes of rough plate glass; Figs. 77 and 78—method of loading clay pouring channels and sewer pipe.

(11) Inclusion of a revised drawing for Fig. 11 of Pamphlet MD-5, covering the loading of large tanks on pivoted bolsters, for clarification.

During July of last year a joint meeting was held in Washington, D. C., at the request of the Department of Defense for the purpose of revising Special Supplements Nos. 1 and 2. As a result of this meeting it was agreed a new publication, Pamphlet MD-7, would be prepared by your committee, covering open-top loading. This pamphlet will contain an up-to-date revision of the present loading methods, loading figures for new items or vehicles, and loading figures from the balance of the MD Pamphlets pertaining to Department of Defense shipments. The necessary general rules, loading information, and figures were agreed on for inclusion in Pamphlet MD-7, which will consist of approximately 360 pages and 100 loading figures and should cover practically all Department of Defense commodities shipped in open-top equipment.

The loading methods formulated will cover a number of new items, some of which have been experiencing trouble en route due to the various loading methods followed having in some cases proven inadequate. Many of these instances were brought to the committee's attention by both the carriers and the Department of Defense and the new and revised loading figures when published will undoubtedly eliminate the great percentage of the trouble experienced. The new figures will cover various types and sizes of trailers, new model tanks, buoys, boat cradles, sectional barges, straddle trucks, rock crushers and other types of road making equipment; and jet, rotary and helicopter engines in metal and wooden containers.

Some of the various types of shipments brought to the committee's attention during the past year, which have proven troublesome to the carriers are as follows:

(1) Motor graders prepared in accordance with Fig. 3, MD-5. This loading figure has been revised to require additional securement.

(2) Motor-cranes prepared in violation of Fig. 35, MD-5. Three of these cases have resulted in serious accidents and considerable expense to the carriers.

(3) Cranes and shovels prepared in violation of Fig. 22-27, MD-5, with rotary portion inadequately secured.

(4) Large fluid-drive crawler tractors prepared in line with Fig. 51, MD-6. Test shipments are being made with a higher type crawler blocking as present blocking has proven inadequate on such shipments.

(5) Large pipe prepared in violation of Fig. 13, MD-4. This loading figure has been modified for clarification to prevent any possible misinterpretation of the number of items of securement required.

(6) Tractors equipped with pneumatic tires prepared in accordance with Fig. 54, MD-6. This loading figure has been revised to require additional securement.

A number of other cases have been referred to the committee, in some of which we have been advised shipments were prepared in accordance with the published rules, and unusual handling has not been a factor in the trouble experienced. This places the failure clearly on the inadequacy of the loading method, which we feel is not a fact in the majority of cases. This contention is also borne out in many instances by the number of satisfactory destination records of similar shipments.

Summarizing activities of the Committee during the past year: All completed subject matter for Pamphlets MD-1, 2, 4, 5 and 6 have been included in the supplement recently published.

Satisfactory progress has been reported by the Subcommittees on the remaining 12 subjects, which will be placed in line for inclusion in the rules when completed.

The draft copy of new Pamphlet MD-7 has been prepared and will be forwarded to the printer for publication as soon as the many revisions and loading methods contained therein have been approved by the Joint Department of Defense Committee.

The report was presented by a committee of which W. B. Moir, chief car inspector, Central Region, PRR, was chairman.

#### Discussion

Comment in the discussion indicated that open-top car loading now constitutes a problem second only in importance to hot boxes.

#### Forest Products Loading

A joint meeting with representatives of the pole shippers from the entire country was held at Memphis, Tenn., on Sept. 30, October 1 and 2, 1952 for the purpose of improving the methods for loading poles and piling, where necessary, and to clarify the intent of the existing specifications. All of the methods were completely revised and simplified and the letter symbols for similar items in each figure made the same. Two methods of loading no longer in general use were deleted.

Pamphlet MD-3 has been reissued as a result of the number of changes in the General Rules and loading figures which have been approved at the joint meetings. As a matter of information, the principal changes in the pamphlet are as follows:

(1) General Rule 1 revised for clarification as a result of a confusion arising on the proper interpretation of the rule.

(2) General Rule 9 revised to include provisions to cover the permissible use of commercial size lumber for wood securement details, except side stakes.

(3) General Rule 10 revised to include the use of southern pine, Larch and hemlock as permissible alternates for hardwood side stakes, also to require the use of staples or nails to prevent wires or bands from working off binder stakes.

(4) General Rule 15 revised to indicate the method of securing cables, when used, and to restrict the use of common wire substitutions to the gages listed in the table, namely 7, 8, 9 and 11.

(5) The revision of Fig. 5-A, for clarification, covering the method of narrowing loads of poles or lumber where two pair of stakes are used, and also new Fig. 5-B on three pair of stakes.

(6) The revision of the lumber loading Fig. 6, 7 and 9, which was circularized in September of last year.

(7) The inclusion of new Fig. 15-A covering an alternate method of loading cross ties.

(8) The revision of the pole loading methods, Fig. 16 to 27, inclusive, for clarification and in some of the figures, increased securement.

(9) The deletion of old loading Fig. 19 account no longer being used.

(10) The deletion of old loading Fig. 20 account including this loading method in the revision of Fig. 18.

It was the opinion of the committee and the shippers that close observance of the revised loading methods in the preparation of pole and lumber shipments will materially reduce the number of loads requiring adjustments previously experienced.

The lumber shippers also brought out the need of a closer inspection by the carriers to insure that the loading rules are followed in the preparation of shipments. The local "On-the-Ground Lumber Committee" functioning in the states of Oregon and Washington has, in the past, rendered invaluable service to the shippers in the proper interpretation and compliance of the load-

(Continued on next page)

## Power Brake Conditions Deteriorating

By W. J. Patterson

Throughout the history of federal regulation of railroad safety, covering more than half a century, it should be noted that the primary purpose and the principal result of such regulation has been to establish standard minimum requirements, applicable to all railroads and equipment.

This association has the responsibility not only of formulating many of these minimum rules and requirements, but also that of enforcing compliance by the member lines. This policing action of the association has been fairly successful along certain lines where adequate penalty provisions have been established and used.

In 1925 members of the Bureau of Safety of the Interstate Commerce Commission cooperated with a committee of the Mechanical Division of the Association of American Railroads in the formulation of a code of rules for the maintenance and testing of air-brake equipment. These rules were issued by the A. A. R. with the statement that they represented minimum requirements. They have since been revised and amended in some respects. However, there is nothing in these rules which requires the adoption or enforcement of this code of air-brake rules by a railroad company.

The records of the Bureau of Safety show that there is widespread non-observance of these rules. In the fiscal year 1952 our inspectors made air-brake tests on 2,661 trains, consisting of 122,214 cars, before departure from terminals. Railroad forces had prepared these trains for departure. However, when afterwards tested by our inspectors, it was found that brakes were defective or inoperative on 5,626 of the cars. As a result of these

tests, 2,744 cars having defective brakes were set out, and the brakes were repaired on 2,828 cars remaining in the trains.

The commission has authority under the Locomotive Inspection Act to enforce such of those rules as pertain to locomotives and it is my view that no one will question the desirability or success of the administration of that authority.

Those rules, formulated in 1925, would, if properly enforced by the railroads, insure proper maintenance of power brake equipment. However, the failure of many railroads to comply with the rules has led to a general deterioration in the condition of power brake equipment on railroad cars. During negotiations between representatives of our Bureau of Safety and of the Association of American Railroads during the past three years with respect to revision of the rules it has been pointed out to the railroad representatives that, because of the failure of many railroads to comply with the present rules, a primary requisite for any set of revised rules must necessarily be some provision to insure enforcement.

Proposed legislation has been introduced to amend Section 25 of the Interstate Commerce Commission Act. This proposed legislation would extend the authority the commission now has with respect to block signal system, interlocking, and other similar appliances, methods and systems intended to promote the safety of railroad operation, as well as automatic train stop, train control and cab-signal devices, to include train communication systems.

ing methods. Since this committee's inception, a marked reduction in the number of violations has been noted. Recently, three new members representing railroads in the State of California have been added to this committee.

There are six subjects still being considered by your committee on proposed changes in the rules and loading figures, which, if approved, will require a supplement to Pamphlet MD-3 at a future date. These subjects cover mainly the loading of creosoted lumber and poles.

The omission of a loading figure in the A.A.R. Loading Rules to cover shipments of unpeeled pulpwood has been brought to your committee's attention repeatedly in the past. It is recognized that some difficulty has been experienced by the carriers on such shipments and a study was made of shipments during June, July and August of last year when adjustment reports, etc., were prepared by the carriers. While 947 cases of shifted loads were reported, 890 or 94 percent, were on seven railroads which operate in Wisconsin and Minnesota, indicating very little trouble is being experienced in other parts of the country. As it was recognized a great percentage of these shipments in the Wisconsin and Minnesota area was over single track railroads, no changes have been included in the revision of Pamphlet MD-3 in regard to unpeeled pulpwood.

The report was presented by a committee of which F. A. Shoultz, assistant superintendent car department, CMStP&P, was chairman.

## Locomotive Construction

The Locomotive Construction report was divided in three sections: steam and electric locomotives; diesel-electric locomotives and gas turbine locomotives.

The report says, "The steam and electric locomotive section has no matters to bring before the members at this time. The matter of further activities of this section is now under consideration by the General Committee."

## Fire Protection for Diesel Locomotives

The Committee recommended that the following, prepared in co-operation with the Fire Protection and Insurance Section of the A.A.R., be submitted to letter ballot for inclusion in Section F of the Manual of Standard and Recommended Practices as Recommended Practice.

Recommendations for minimum fire protection equipment on diesel-electric locomotives:

1. Road locomotive.
  - A. In cabs—1 carbon dioxide or 1 dry chemical extinguisher having a minimum capacity of 20 lbs. or their equivalent.
  - B. In engine room—A total of 60 lbs. dry chemical or carbon dioxide to be divided in either two or three extinguishers of equal size, that is two 30 lbs. extinguishers or three 20 lbs.
2. Hood type locomotive, i.e., switchers, road switchers and general purpose locomotives.
  - 2 carbon dioxide or 2 dry chemical extinguishers having a minimum capacity of 20 lbs. or their equivalent. If placed in engine compartment, location should be plainly marked on the outside. At least 1 extinguisher should be placed in the cab.

Extinguishers should be located to the best advantage in the engine room of road type locomotives. One extinguisher should be available at each end of the engine room.

## GOOD HOUSEKEEPING

Experience has proven that the cleanliness in diesel-electric locomotive operation is most important to reduce fire hazards and prevent fires in this type of motive power. Good housekeeping is essential in the prevention of fires. The Fire Protection and Insurance Section suggests the following danger points on diesel locomotives as usually neglected:

1. Between banks of the engine.
2. Space between scavenger motor blowers and under same.
3. Traction motor blower screens and fans.
4. Behind and around air compressors.
5. Around fuel pumps.
6. Space behind and around steam generator.
7. Around oil filters.

8. Space behind high voltage control cabinets.
9. Main generator sump.
10. Space under operator's cab.
11. The nose of unit.
12. Space around controller and braking equipment.
13. Cab heaters.
14. Running gear—traction motors and top of fuel oil tanks; also under body of car.

## MOTOR SUSPENSION OR SUPPORT BEARINGS

To date no satisfactory means have been suggested to provide a warning for overheated motor support bearings. Proper maintenance and servicing practices will go far toward eliminating these bearings as a potential hazard. The following suggestions are offered as to action necessary when a hot suspension bearing is encountered:

1. Traction motor and wheel and axle assembly must be removed from service.
2. The axle must be carefully examined for thermal cracks by suitable magnetic particle testing or other means. Axles must be checked for distortion by being rotated between suitable centers.
3. Traction motor must be examined for distortion of the bearing support structure. If heat has been excessive an electrical examination must be made to detect possible damage to field coils. Armature bearing adjacent to the overheated suspension bearing must be examined for loss or destruction of the lubricant.
4. Out-of-round or shelled wheels will contribute to suspension bearing difficulties and may be considered as a primary cause for overheated bearings.

## IMPROVEMENT IN TRACTION MOTOR ARMATURE BEARINGS

Previous reports have mentioned an investigation conducted by one of the major builders of diesel-electric locomotives with the co-operation of the Santa Fe. This investigation has now been completed, and a summary of the improvements accomplished follows:

Starting in October, 1949, the Atchison, Topeka and Santa Fe, in collaboration with the Electro-Motive Division of General Motors, conducted field test using 147 motors, on traction motor conditions with particular attention to bearings and the supporting structure for the armature bearings, types of lubricants, and this project, which is practically completed, has resulted in the following mechanical improvements:

1. A larger capacity pinion and armature bearing, which has estimated 18 per cent more load capacity.
2. A commutator end bearing retainer which is bolted on, eliminating the old design of the nut type which necessitated the use of set screws and special threads for application and locking.
3. Traction motor frames strengthened at the axle bore and at the pinion end armature bore by use of gussets and thicker sections.
4. The use of a drop forged bearing housing or frame head in place of the old cast type.
5. The development and use of a one-piece pinion end armature bearing outside seal which interlocks into a mating part to keep crater compound from the pinion end bearing and contaminating the lubricant.
6. Development of safe assembly and dismantling methods.
7. Practical tolerances for all parts were agreed on and proved by the project.
8. Inspection methods and checks to cull out bad armature bearings were set up.

Section Two of the report dealt with eight items all of which had to do with suggested standardization of couplers and lube-oil filter elements. Other sections dealt with derailments due to overheated motor suspension bearings and traction-motor bearings; road service test of wheel-slip-indicating devices; strength of diesel locomotive main frames; designation of sides and ends and methods to improve the shunting of track circuits on single-unit self-propelled cars equipped with disc brakes.

## SHUNTING OF TRACK CIRCUITS

With respect to the difficulties encountered in signal operation on single-unit self-propelled cars equipped with disc brake the committee recommended the following precautions:

1. Wheel tread conditioning shoes must be provided and be

inspected carefully and frequently for wear, alignment and pressure. Record of inspection should be maintained.

2. Track circuits should be adjusted to provide good shunting sensitivity.

3. Track relays which are inherently slow in releasing should be replaced.

4. Stagger of insulated rail joints and dead sections should be reduced to a minimum, particularly within interlocking limits.

5. Protection against momentary loss of shunt should be provided in traffic locking circuits, interlocking approach circuits, highway crossing protection circuits, etc.

6. Special measures should be taken for operation on secondary track or branch line equipped with signal facilities where traffic density is light.

7. Enginemen should be instructed in braking and sanding methods to prevent the car coming to a stop on a layer of sand.

The third section of the report—that dealing with gas-turbine locomotives—was in the nature of a progress report on the units which have been under test in this country as well as a summary of recent developments on foreign gas-turbine locomotives.

With respect to the L.D.C. coal-burning gas turbine the committee mentioned that the work underway at the present time is divided into three major parts:

"First"—Methods of handling pre-pulverized coal are being studied, including new developments in the field of loading, transporting, and unloading pulverized materials. The assistance of the coal industry is being enlisted to determine the most economical way of obtaining coal in a form which will eliminate the necessity for any further preparation on the locomotive.

"Second"—Major attention is being concentrated on improvements in the ash removal system. Laboratory tests have resulted in a separator tube of higher efficiency than the tube used during the 750-hour test, and a new separator is being designed which

will embody these improvements. Attention is also being given to improving the life of the other components of the coal and combustion system.

"Third"—Preparations have been completed for procuring replacement blades for the L.D.C.-Allis turbine. It is expected that operation of this unit will be resumed in September of this year."

#### Union Pacific Gas Turbine Electric

During the year 1952, six 4,500-hp. gas turbine electric (abbreviated GTE) locomotives were placed in regular freight service on the Union Pacific Railroad between Ogden, Utah, and Green River, Wyoming.

The Ogden to Green River run is 176 miles long, having a ruling grade of 1.14 per cent for the first 65 miles eastbound out of Ogden which requires the use of helper locomotives. The ruling grade for the remaining 111 miles is 0.82 per cent. Elevation at Ogden is 4,298, and at Green River 6,083 feet above sea level. At the highest elevation en route, 7,227 feet above sea level, is located the 6,706-foot long Altamont tunnel on the westbound main line. This tunnel has an ascending grade of 0.60 per cent. Nearby Aspen tunnel on the eastbound main line is 5,900 feet long and has a 0.40 per cent descending grade. Maximum curvature in this territory is 7 degrees.

As of December 31, 1952, these six GTE locomotives had made a total of 2,356 trips for a total mileage of 413,623 and a total 1,000 gtm. of 1,387,462. Availability was 80.1 per cent. Total fuel per mile was 14.91 gallons, 14.05 gallons of which was turbine fuel and .86 gallons diesel fuel. Fuel consumption per turbine hour was 351 gallons. Total turbine hours was 17,290. Fuel consumption per 1,000 gtm. was 4.45 gallons.

The GTE locomotive can generally exceed theoretical tonnage

(Continued on next page)

## More Long Flat Cars—Better Floors

By E. A. Londahl

How can the railroads improve their service to the manufacturers of farm machinery and equipment, and how may they assist in the distribution of this equipment to the farms of our nation, and abroad? There are many ways in which this can be accomplished. I will mention only those which I think are of major importance. These are: (1) adequate supply of long flat cars with good decks; (2) improvement of stake pockets on freight cars; (3) installation of anchor plates of "hold-downs" in floors of all cars, and in the side of box cars, and (4) better policing to prevent pilferage of equipment loaded on open-top cars.

Let's consider the supply of flat cars suitable for the loading of tractors, grain combines, corn pickers, hay balers, and similar types of farm machinery. Most of this machinery is seasonable, and therefore presents an annual problem of supply of the right types of cars.

When I say "right type of cars," I mean flat cars longer than 50 ft. with good decks. There are approximately 28,000 available flat cars over 50 ft. in length. Of this number nearly 18,000 cars are of western railroad ownership; and slightly more than 2,000 cars are of Canadian railroad ownership. When you deduct from this total the number of cars in bad order and out of service and those not suitable for the loading of farm machinery, there is little wonder that our industry is faced with the annual problem of finding enough flat cars to transport much needed machinery to the nation's farm communities. In fact, more of the longer cars are essen-

tial now because more of this equipment is being shipped completely assembled than in the past. It has been found from experience that it is more practical to ship tractors or grain combines completely assembled than to take them apart for shipment and to reassemble them in the field of operation.

The decks of many flat cars are badly in need of repair and tractors and other farm machines continue to fall from moving trains. Now this is due, in many instances, to the fact that the decks of some flat cars are in such condition that they simply do not hold the blocks and supports nailed to them.

Our shippers have found that edges of stake pockets are sometimes sharp and, therefore, cut the wires used to secure tractors and other farm machines to car decks. The result is the lading becomes loose and with vibration of the car when in motion, it clears the blocking on the car floor.

How can our railroads help to prevent situations like these? Simply by doing two things—(1) build solid car decks and (2) install stake pockets with rounded edges. To this I might suggest also that all cars, both box and flat cars, be equipped with anchor plates or cleats in the side walls of box cars, recessed rings in car floors, and hooks in the sills of flat cars. Such devices for holding heavy machinery in place while in the course of transportation would not only be good insurance against damage to machinery shipped, but would more than pay for itself in the prevention of wear and tear on car decks.

ratings. Theoretical tonnage rating westbound Green River to Ogden with a ruling grade of 0.82 per cent is 4,890. On several occasions 5,400 tons have been successfully handled. Eastbound the theoretical tonnage for the 1.14 per cent grade without helper is 3,570, for the 0.82 per cent grade 5,010. On occasion 4,000 tons have been handled without helper on the 1.14 per cent grade, and 5,900 tons with helper. On the 0.82 per cent ruling grade eastbound, 5,900 tons have been handled.

Gas turbines are changed out in these locomotives in much the same manner as diesel engines are changed in diesel electric units. For the six GTE locomotives one spare gas turbine complete, and three additional spare rotors are assigned to the spare parts pool.

It is the desire of both the manufacturer and the railroad to develop these locomotives into as trouble free a type of motive power as possible. As a result some modifications have been made whenever the opportunity permits. These modifications include improvements to fuel nozzles, combustion chamber liners, rotor blading, combustion air inlet location, weight distribution to front truck, etc. Every effort is being made to simplify the complex electrical equipment and eliminate some of the gadgets which are the curse of all electric drive locomotives.

As a result of the performance of the first six GTE locomotives, the Union Pacific management has placed an order for 15 GTE locomotives. With the six now in service, plus the four yet to be delivered during 1953 on the first order, there will be a total of 25 GTE locomotives. Delivery of the second order of 15 is scheduled for 1954.

The second order will be essentially the same as the first order. The car body will be changed to hood type between the cab and steam generator room to permit easier access to equipment. Compressor air intake will be located on the roof and compressor air will be unfiltered. Dynamic brakes will be arranged to operate when the turbine is shut down and the locomotive controlled by the 250-hp. diesel hostling engine.

#### Report on Operation of Westinghouse Oil Fired Gas Turbine Passenger Locomotive

Following the service outlined in the 1952 report of the Committee the Westinghouse gas turbine locomotive was placed in service on the Missouri-Kansas-Texas Railroad in passenger service between Denison, Texas, and Parsons, Kansas, handling the "Katy Flyer" northbound and the "Blue Bonnet" southbound. Following this the turbines were opened for inspection, then reassembled and the locomotive was placed in operation on the Chicago and North Western handling the "Duluth-Superior Limited" westbound and the "Victory" eastbound between Elroy, Wisconsin, and Chicago, Illinois, a daily round trip of 423 miles.

A summary of the performance on the Pennsylvania, M-K-T, and C&NW follows:

	PRR	M-K-T	C&NW
No. of trips scheduled.....	59	103	138
No. of trips made .....	55	101	120
Availability for assigned runs....	93%	98%	87%
Road delays .....	None	1	5
Average length of train—Cars.....	26-29	11-15	12-17
Train miles .....	7100	27775	25380
Gals. oil per car mile (Approximate) .....	0.23	0.53	0.57

The above operation was generally made with No. 6 residual fuel oil although some diesel fuel had been used, and some operation for experimental purposes with No. 4 residual fuel. The residual oils used were commercially available grades with low ash and low vanadium content and were not subjected to any special treatment. Diesel fuel and residual oils were mixed without compatibility difficulties.

Fuel consumption has been approximately twice that of diesel locomotives in the same service. The price paid for residual fuel has varied from 3.5 cents per gallon up as compared with diesel oil of 8.6 cents per gallon up. Lubricating oil consumption was practically nil.

The fuel consumption of 0.23 gallons per car mile was questioned; the runs on the Pennsylvania were all non-stop with long heavy trains, an ideal load for the gas turbine type of locomotive.

#### N.&W. Coal-Burning Steam Turbine Electric Freight Locomotive

Delivery to the Norfolk and Western of a 4,500 hp. coal-burn-

ing steam turbine electric locomotive is scheduled for summer of this year.

This locomotive is a single unit, having a 6-6-6 wheel arrangement. The weight of the locomotive in working order, including 20 tons of coal which will be carried on the locomotive is 765,000 lb. The overall length is 111 feet 7½ inches.

The total weight of the loaded tender, which has a capacity of 22,000 gallons, is 365,000 lb. This weight includes water softening equipment which will be located on the tender. The tender will be carried on two six-wheel roller bearing trucks. Its length is 49 feet 6 inches, giving a total overall length of locomotive and tender of 161 feet 1½ inches.

The boiler is of the water tube type, natural circulation, having a capacity of 51,400 pounds of steam per hour at 600 p.s.i., and 900 degrees F. The boiler is fired by a stoker similar to the conventional locomotive stoker, with steam jets to distribute the coal over a traveling grate. The design also includes forced draft, an economizer, an air heater, and pneumatic controls for automatic operation.

Steam from the boiler will drive a non-condensing impulse type turbine, which will be connected through a set of single reduction gearing to a two-unit direct current generator. Current from the generator will drive the locomotive's twelve traction motors, one mounted on each axle of the locomotive. Provision is made for dynamic braking.

The construction of the locomotive is a joint project of the Baldwin-Lima-Hamilton Corporation, Westinghouse Electric Corporation, Babcock & Wilcox Company, and the Norfolk and Western.

#### Nomenclature of Locomotives Having Electric Transmission

The Committee has had some correspondence with the Car Service Division in which Dr. W. H. S. Stevens, Director of Bureau of Transport Economics and Statistics, Interstate Commerce Commission, made some suggestion on this subject. A revision of pages F-103 to F-104A of the Manual has been made in the hope that a better explanation of the various designations would be provided. The revision of Manual pages 103, 104, and 104A are to be submitted to letter ballot. [See diagram on opposite page—EDITOR]

#### STANDARD SYSTEM OF NOMENCLATURE FOR LOCOMOTIVES HAVING ELECTRIC TRANSMISSION

Starting at the front end of locomotives designed for single end operation or at either end of locomotives built for double end operation, the wheels in any wheel base, the truck connections for the individual units, and the connections between such units, are designated in their consecutive order. Letters represent the driving axles, numerals the guiding or carrying axles or the number of units, and arithmetical signs the type of connections between units and the type or absence of connections between trucks.

1. The number of adjacent driving axles (a) in a rigid wheel base, or (b) on a truck, is represented by a letter selected according to its alphabetical order.

Examples: A One driving axle.

B Two driving axles.

C Three driving axles.

D Four driving axles, etc.

2. The number of adjacent idler (non-driving) axles in a rigid wheel base or a truck is represented by an Arabic numeral.

Examples: 1 One idler axle.

2 Two idler axles, etc.

3. Trucks having both driving and idler axles in the same rigid wheel base are designated by a letter and a numeral placed together in proper order.

Examples: 1A Truck with one idler and one driving axle.

1B Truck with one idler and two adjacent driving axles.

A1A Truck with one idler and two non-adjacent driving axles.

Additional examples of various truck wheel arrangements are shown in diagram form on Manual page F-104A.

4. Plus (+) signs are used to indicate:

Articulated connections between trucks under a single unit locomotive, or between units of a multiple unit locomotive. An articulated connection as used for this purpose generally involves

**DIAGRAMS OF AXLE ARRANGEMENTS OF TRUCKS AND LOCOMOTIVES HAVING ELECTRIC TRANSMISSION**

LINE NO.	DESCRIPTION OF TRUCK OR LOCOMOTIVE	DIAGRAM OF AXLE AND TRUCK ARRANGEMENT	DESIGNATION
1	Two Wheel Truck. (a) With driving axle.	①	A
2	(b) With idler axle.	②	I
3	Four Wheel Truck. (a) With all driving axles.	③ ④	B
4	(b) With all idler axles.	⑤ ⑥	2
5	(c) With leading idler axle.	⑦ ⑧	1A
6	(d) With leading driver axle.	⑨ ⑩	A1
7	Six Wheel Truck. (a) With all driving axles.	⑪ ⑫ ⑬	C
8	(b) With all idler axles.	⑭ ⑮ ⑯	3
9	(c) With center idler axle.	⑰ ⑱ ⑲	A1A
10	(d) With leading idler axle.	⑳ ⑳ ⑳	IB
11	Eight Wheel Truck. (a) With all driving axles.	⑳ ⑳ ⑳ ⑳	D
12	(b) With all idler axles.	⑳ ⑳ ⑳ ⑳	4
13	(c) With leading and trailing idler axles.	⑳ ⑳ ⑳ ⑳	IB1
14	(d) With leading and trailing driving axles.	⑳ ⑳ ⑳ ⑳	A2A
15	(e) With leading and second idler axles.	⑳ ⑳ ⑳ ⑳	2B
16	(f) With second idler axle.	⑳ ⑳ ⑳ ⑳	A1B
17	Single Unit Locomotive. (a) With two swivel 4 wheel trucks-all driving axles.	⑳ ⑳ ⑳ ⑳	B-B
18	(b) With two swivel 6 wheel trucks-center idler axle.	⑳ ⑳ ⑳ ⑳ ⑳ ⑳	A1A-A1A
19	(c) With two swivel 6 wheel trucks-all driving axles.	⑳ ⑳ ⑳ ⑳ ⑳ ⑳	C-C
20	(d) With 3 wheel guiding truck and one 8 wheel truck having all driving axles.	⑳ ⑳ ⑳ ⑳ ⑳ ⑳ ⑳ ⑳	1-D
21	(e) With 4 wheel guiding truck and two 4 wheel trucks having all driving axles, with articulated connection between driving trucks, Guiding truck and 2 pair of drivers included in same frame.	⑳ ⑳ ⑳ ⑳ + ⑳ ⑳	2-B+B
22	(f) With 4 wheel guiding truck at each end of locomotive, and two 8 wheel trucks, having all driving axles and with articulated connection between driving trucks, Guiding truck and 4 pair of drivers included in same frame.	⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳	2-D+D-2
23	(g) With four 4 wheel swivel trucks, all driving axles with trucks assembled in pairs by means of a open bolster with no connection between pairs of trucks.	⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳	B-B-B-B
24	Multiple Unit Locomotive. (a) Two units, each with two 4 wheel swivel trucks, all driving axles with articulated connection between units.	⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳	2+(B-B)
25	(b) Two units, each with two 6 wheel swivel trucks having center axle idler, and units connected by automatic couplers.	⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳	2+(A1A-A1A)
26	(c) Three units, each with two 4 wheel swivel trucks having all driving axles, units connected by automatic couplers.	⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳	3+(B-B)
27	(d) Three unit locomotive with 4 wheel guiding truck as leading and trailing unit with all units having two 4 wheel driving trucks, with articulated connection between driving trucks and permanent drawbars between units. Guiding truck and 3 pair of drivers included in same frame.	⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳ × ⑳ ⑳ ⑳ ⑳ × ⑳ ⑳ ⑳ ⑳ × ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳	(2-B+B)×(B+B)×B+B-2
28	(e) Four units each with two 4 wheel swivel trucks, all driving axles with drawbar connection between 1 <sup>st</sup> and 2 <sup>nd</sup> and between 3 <sup>rd</sup> and 4 <sup>th</sup> units and automatic couplers between 2 <sup>nd</sup> and 3 <sup>rd</sup> units.	⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳ + ⑳ ⑳ ⑳ ⑳ - ⑳ ⑳ ⑳ ⑳	2+[(B-B)×(B-B)]

Note—Minus sign = No connection. Plus sign = Articulated connection. Multiplication sign = Drawbar. Division sign = Automatic coupler.

I = Idler Axle. M = Motor or driving Axle.

**Axle arrangement diagrams for locomotives with electric transmission.**

the use of one pin, the connection having freedom vertically and horizontally.

5. Minus (—) signs are used to indicate:

- (a) Separation between swivel type trucks, not articulated.
- (b) Separation between a rigid base of any group of driving wheels and adjacent guiding or carrying trucks not connected through an articulated connection.

6. Multiplication (×) signs are used to designate permanent drawbars between the units of multiple unit locomotives. A permanent drawbar as used for this purpose involves the use of two pins, and a connecting link.

7. Division (÷) signs are used to designate automatic couplers between the units of multiple unit locomotives.

8. On locomotive units where two swivel trucks are connected by a common or span bolster, or where a guiding truck and one or more pairs of driving wheels are incorporated into the same frame, such truck assemblies shall be underlined to designate such grouping of trucks, or guiding trucks and driving wheels.

9. (a) When two or more similar motive power units, each with the same or symmetrical wheel arrangement, are operated in multiple as a locomotive, the number of units is indicated by a numeral and either a division sign, multiplication sign or a plus sign to show automatic couplers, permanent drawbars, or articulated connections, respectively, preceding the classification of one unit put in parenthesis.

(b) When two or more units with dissimilar wheel arrangements are operated in multiple, the wheel arrangement of each unit is shown in consecutive order, starting from the front of the locomotive, setting off each unit by parenthesis with plus, division, or multiplication signs between the units to represent articulated connections, automatic couplers, permanent drawbars, respectively, to indicate connections between the units.

10. Examples of designating wheel arrangements of single and multiple units with various types of trucks, and connections between trucks and units, are shown in diagram form on Manual page F-104A.

#### Discussion

Most of the discussion emphasized the absolute necessity of good maintenance such as the cleaning, especially of electrical parts, which is most difficult, in the interest of fire prevention. A member from the Southern Pacific advocated the use of solvents even in electrical cabinets, which should have a minimum of crevices and be provided with bottom drains.

A member from the Louisville & Nashville urged more standardization of diesel parts, especially oil-filter elements and train-line hose which latter, if not hung on the "dummy," often will swing free and clear the rail less than 2½ in. The answer is not to stock different length hose which is bound to lead to trouble, but change the pipe connections to the height necessary for one standard hose.

The report was presented by a committee of which A. G. Hoppe, mechanical engineer, CMStP&P, was chairman.

## Prices for Labor and Materials

In order that the rules may currently provide an equitable basis for inter-road billing, the Committee on Prices has continued the work of analyzing material, labor and new equipment costs in A.A.R. Interchange Rules 101, 107, 111, and 112 of the Freight Car Code, and Rules 21 and 22 of the Passenger Car Code, with a view of determining and recommending necessary changes to be made in the next supplement to the current code.

The following modifications are recommended: New Item 107-E added to provide charge for "housing assembly only" on horizontal design geared hand brakes, present Items 107-E, 107-F and 107-G renumbered as 107-F, 107-G and 107-H.

Item 169-J modified to indicate charge covers oil lubrication only on journal roller bearing units.

New Item 169-K added to provide charge for grease lubrication of journal roller bearing units.

Note following present Item 169-J relocated following new Item 169-K to indicate that it applies to both items.

Heading of second column in table A.A.R. Standard No. 18 Brake Beams, Fig. 2, modified to indicate "Repaired per A.A.R. Standard Specification and Test," instead of "Repaired or Secondhand."

Certificate of Approval No. 69 added to Item 217 and to brake beam identification table (Fig. 2) to provide for an additional approved brake beam.

Present Note 1 (secondhand beams) under present Item 213 relocated as new Note 3 following Item 221 to indicate it also applies to No. 18 beams.

As recommended by the Committee on Couplers and Draft Gears, the following additions, deletions and modifications are made in Sections I, I-A and II of the Draft Gear Table.

#### NEW RESEARCH LABORATORY COMPLETED

To provide additional facilities for journal-box and bearing research and for the study of other problems of the Division, the General Committee reported that a new mechanical research laboratory has been built at Chicago. In it facilities for lubrication research will be built up, the draft-gear testing machinery will be moved from Purdue University and better facilities provided for refrigerator car research.

Item 250 covering American Steel Foundries Quad draft gear eliminated.

Item 250-G covering National Malleable M-50-B draft gear removed from Section I and added to Item 254-D of Section II.

Notes 4 and 5 following Item 250-L of Section I modified to include additional number and types of rubber gears.

New Note 6 following Item 250-L of Section I, added to provide for additional types of rubber gears.

Heading of Section I-A modified to indicate it applies only to existing cars of special construction and new ore cars.

New Items 250-R, 250-S, 250-T and 250-U added, to provide for additional types of approved short draft gears in existing cars of special construction and new ore cars.

Note following present Item 250-Q in Section I-A modified and renumbered as Note 1 covering short draft gears.

New Note 2 added following Item 250-Q to indicate proper charges and credits covering short draft gears.

The following draft gears removed from Section II account being shown in Section I-A: 251-D, Cardwell L-11-S; 251-H, Cardwell V-18; 253-G, Miner A-69-XB; 253-J, Miner A-100-D; 256, Waugh-Gould 451.

Immediately upon receipt of announcement of the four cents general increase in hourly wage rates paid to employees engaged in car repairs, the major items containing both labor and material were reviewed and labor portion modified accordingly. These changes were announced in circular letter issued by the secretary on March 23, 1953, effective April 1, 1953.

Immediately upon receipt of announcement of the three cents decrease in hourly wage rates paid to employees engaged in car repairs (cost of living escalator clause), the major items containing both labor and material were again reviewed and labor portion modified accordingly. These changes were announced in circular letter issued by the Secretary on April 15, 1953, effective May 1, 1953.

In accordance with these two changes in labor rates, Item 92, Rule 107, covering freight-car labor was increased to 3 dollars 30 cents an hour and subsequently decreased to 3 dollars 25 cents an hour. Similar changes were made in Rule 111 and Passenger Car Rules 21 and 22.

Recommendations are made in Rule 112 respecting pound prices of new freight cars of all classes, in order that the August 1, 1953, Supplement may reflect 1952 costs in lieu of figures shown in the present code. New prices recommended are based on the cost of 52,155 freight cars built in 1952.

The report was presented by a committee of which T. J. Boring, general foreman M. C. B. Clearing House, PRR, was chairman.

#### Brakes and Brake Equipment

A subcommittee decided to furnish four types of hose clamps; air hose, nipples and couplings, in order that the A.A.R. test laboratory might make the tests necessary to furnish the committee data to prepare specifications that cover hose clamps and the methods of application.

An auxiliary device to determine freight-car air leakage comprised of a Flowrator and controlling diaphragm cock for connecting directly to the present standard single car test device was furnished each member of the committee. This equipment was used to test 2,390 freight cars between December 17, 1952, and March 17, 1953, with the following results:

Number of cars passing Flowrator leakage test.....	1,533
Number of cars condemned by Flowrator .....	857
Leakage found in brake pipe and fittings.....	588
Leakage found in AB valve and gaskets.....	67
Leakage found in reservoir pipes and fittings.....	198
Cars requiring more than 15 min. to charge system ...	75

The Flowrator detected excessive leakage in AB valves and reservoir pipes of 265 cars or 30 per cent of all cars condemned that would not have been found by the present standard single car test device. A northern railroad tested 588 cars with this device and condemned 169 or 28.7 per cent. The greatest percentage of these cars were condemned for excessive leakage when the temperature was between 11 and 20 deg. F. The subcommittee on this subject has been instructed to collaborate with air brake manufacturers in modification of the present single car testing device that will provide a more restrictive release test for both passenger and freight cars.

Instruction pamphlet No. 5039-2 covering code of test for U-12 Universal valve on the 3-USB test rack was approved after minor changes. It was found necessary to revise instruction pamphlet No. 5039-21 covering code of test for D-22 control valves and 5-D vent valves with the service stability test being the primary functional change made in this test code. The committee believes that some change should be made in pamphlet No. 5039-19 dated April, 1945, covering code of test for AB valve, in view of the above action.

The committee recommended as a letter ballot item the addition of the choke size for the vented cap nut for passenger-type retaining valve, involving changes in Manual Page E-27. This revision includes a No. 47 drill size choke in the vented cap nut for D-22 brake equipment.

The subcommittee has been instructed to prepare a suitable note to cover the use of the gage for worn AB cover gaskets for inclusion in pamphlet No. 2391 covering shop maintenance of AB valves.

An inspection was made of 25 ABLC (load-compensating) brake equipments that have been in service an average of 28 months on Illinois Central 50-ton hopper cars. The inspection covered both an examination of the equipment as found on the cars and of the operating parts after they were dismantled. The equipment was found in generally good condition except for an unusual number of broken pipes and loose bolts and nuts. Several slack adjusters were inoperative because of heat-damaged parts or burned hoses. There were three failures to pass the single car test that were chargeable to faulty ABLC equipment. Several compensating valve portions failed to pass the AB test rack code for new valves. The examination of the parts showed the equipment in good clean condition with a few exceptions and it is believed that the new design of the 7-in. by 12-in. brake cylinder will eliminate some of these exceptions. Another inspection and test will be made on an additional 25 cars at about a 40-month service period after which a report will be made.

An inspection and test was also made on 36 QRR brake cylinder release valves on Illinois Central cars. All were found to be in perfect working condition and it is believed this valve is operating as intended and will take appreciable wear without malfunction.

The committee recommended as a letter ballot one change in Manual Page E-13-51 covering brakes for heavy high-capacity cars and also included three applicable braking arrangements for high-capacity freight cars requiring more braking power than available with a single capacity single cylinder AB brake and not coming within the scope of the ABEL empty-and-load or the ABLC load-compensating brake combinations.

As information, a subcommittee on automatic slack adjusters was instructed to prepare complete specifications, instructions regarding certificate of approval and a suitable test code. The proposed specifications developed to date include 16 special and 7 general requirements.

To date the air brake companies have made no suggestions or recommendation as to the cause of "stuck brakes" experienced in freight trains of all AB brakes.

The committee proposed that pamphlet No. 2391, supplement 1, covering repair track maintenance of AB brakes include a sentence added to Par. 24, Page 14 to read: "Apply new gaskets to both brake pipe hose couplings."

The location of angle cock on passenger trains equipped with tight-lock couplers is covered in the Car Construction Committee report.

The report was presented by a committee, of which T. H. Bickerstaff, general supervisor of air brakes, AT&SF, was chairman.

#### Discussion

Several members referred to the value of the Flowrater during the discussion. One road is ordering a considerable number because it is believed a necessity in overcoming leakage on long trains.

Referring to the finding of an unusual number of broken pipes and loose nuts and bolts in the inspection of the AB load-compensating brakes on the Illinois Central hopper cars. A representative of the Westinghouse Air Brake Company said that the condition of the cars was poor because many of them were held on tracks until 25 cars could be accumulated.

#### Arbitration Committee

The principal changes recommended by the Arbitration Committee are as follows:

Modification of first paragraph of Sec. (c) Rule 2 is recommended, to more definitely define the general rules referred to and to eliminate any misunderstanding, as recommended by the Operating-Transportation Division.

Modification of Par. (1) of Sec. (d) of Rule 2 is recommended, to eliminate an unnecessary requirement with respect to securing of portable heaters which has not generally been compiled with, and to conform with present practices.

Addition of new Par. (3) to Sec. (d) of Rule 2 is recommended, to provide for the interchange of cars equipped with gasoline-driven refrigeration units. In this connection, the Operating-Transportation Division has been requested to include suitable notes in the publications Railway Line Clearances and Official Railway Equipment Register so that this provision can become effective in the 1954 Code.

Based on recommendations of the Committee on Couplers and Draft Gears, modification of third note following Par. (d-1) of Rule 3 is recommended to provide for the application of approved types of short draft gears only to ore cars.

Modification of second paragraph of Rule 5 and entire Rule 94 is recommended, to provide an increase in time limit for repairs made on authority of A.A.R. defect cards.

Modification of Note (9) following Par. (e) of Rule 17 is recommended, to clarify the intent that provision with respect to issuance of defect card does not apply where hanger type beam applied is A.A.R. Standard No. 18.

Based on recommendations of the Committee on Couplers and Draft Gears, modifications of Sec. (i-1), (i-6), note following (i-6) and note following interpretation (c-2) of Rule 17; Interpretation (7) of Rule 88; Heading, Paragraphs (1), (2), (3), (4), (5), (7) and (8) of preamble "Friction Draft Gears"; heading of Sec. I and II of Rule 101; Par. (b) and Item (7) of Sec. (1) of Rule 104 and Interpretation (7) of Rule 122 are recommended, to provide for new types of draft gears approved and the reclassification of existing types.

Modification of Par. (q) of Rule 17 is recommended, to clarify the intent regarding charges and credits applicable when A.A.R.

(Continued on next page)

## "Railroading Is a Business"

By William White

I would like to talk about an aspect of your work somewhat different from those usually discussed at a meeting of this type—not as a science, not as a form of technology, not as a profession—but as a business.

Railroading is a business. Too often railroad men don't think of a railroad as being like other businesses—like a manufacturing company, for instance, or a department store. The same rules which govern success or failure in any other business also apply in railroading: (1) a railroad is operated for the primary purpose of making a profit; (2) it attempts to make that profit by producing and selling a service; (3) all the auxiliary benefits which it creates are possible only if the railroad succeeds in its primary task of making a profit; (4) it can succeed in that task only if it produces a service of such quality and at such price that it can be sold in quantities commensurate with the size of its property investment.

We talk and think in terms of car-miles per hot box set out, and miles per engine failure. Those terms are useful, convenient and significant. We need them. But we should think and talk in terms of customer good will lost per hot box set out, or passengers delayed and irritated per engine failure.

The really bad thing about mechanical failures and delays is that they inconvenience our customers and make it harder for us to sell our service and we have to sell it if we're going to make a profit the way a business enterprise should.

The only kind of transportation you can sell enough of to keep a railroad healthy is good transportation—the

kind that customers will buy. Today's transportation customer wants dependability. He isn't interested in hearing about the set-outs or the engine failure or any of the other things that may cause them to run otherwise. Very seldom if ever can you give him an excuse that will be satisfactory from his viewpoint.

Unfortunately, product failures in our business are permanent and beyond repair. Our product is service. We have to be able to provide it when, as and where our customers want it. If we don't, somebody else will.

There is great opportunity to increase efficiency by better budgeting and programming of maintenance work. Some railroads are still trying to cut the cloth of their maintenance expenditures on a month-to-month basis, changing their programs many times a year to match fluctuations in revenue or estimated revenue.

Intelligent, efficient maintenance programming requires commitments far enough in advance to permit coordination of materials, machines and manpower. By commitments I mean *firm* commitments that the management will stand by. Perhaps some managements need to be sold that this is the right way to handle maintenance work. If that's true of your management, then it's your job to do the selling.

I shall not dwell in detail upon the vast changes that have come about in our business through research and technological advancement, except I think it appropriate to recall this is the twentieth anniversary of the introduction of corrosion resistant high strength steel. We have made some mistakes in its use, but we have learned—and that is what is important.

standard or A.A.R. alternate standard tubular axles are substituted for each other.

Addition of new Interpretation (M-12) in Rule 17 is recommended, to allow car owner the opportunity of reclaiming truck side frames that failed on foreign lines that might be restored to service after complying with Rule 23.

Modification of Par. (f) of Rule 60 is recommended, to provide alternate location of stenciling on hopper cars for periodic air brake attention.

Based on recommendations of the Committee on Lubrication of Cars and Locomotives, modification of third note following Interpretation (4) of Rule 66 and second note following "List of Packing Retainer Devices Approved for Roads Desiring to Use Them," in Rule 101, is recommended, to provide for new design short type spring packing retainer for separable bolted journal boxes and to provide for the removal of long spring type retainers from types of journal boxes where they cause damage to journals.

Modification of Rule 84 is recommended, to enable receiving road to obtain protection from car owner or delivering line for rusted or pitted journals of cars offered in interchange where caused by flood conditions.

With the concurrence of the Committee on Car Construction, the addition of a new table covering "List of A.A.R. Approved Equivalent Bottom Rod Safety Supports" in Rule 101 is recommended, to provide ready reference for the benefit of all concerned.

Modification of Rule 124 is recommended, to clarify the intent as to the duties of the Mechanical Inspection Department, the direction and supervision of same, and to bring the rule up to date in line with present railroad requirements.

Modification of Manual pages L-95 to L-131, "Regulations Governing Inspection and Repairs of Foreign Cars and Billing Therefor Under A.A.R. Rules of Interchange," is recommended, as a letter ballot proposition, to clarify the intent and bring the regulations up to date in line with present practices. Proposed changes are shown in Exhibit A of this report.

The committee does not feel that any of the other modifications included in its report necessitate submission to letter ballot.

The report was presented by a committee of which J. A. Deppe, superintendent car department, CMStP&P, was chairman.

## Geared Hand Brakes

As of May 22, A.A.R. Certificates of Approval had been issued for a total of 33 types of geared hand brakes—21 vertical wheel type, 9 horizontal wheel type and 3 lever type. These were listed in the report, and Interchange Rule 101 will be revised to show additional types not now included, together with changes in references as required.

Definite proposals have been formulated for amplifying present specifications and revising some of the details in regard to the kind and grade of material to be used in the manufacture of geared hand brakes. A joint meeting will be held with the manufacturers' engineering committee to review these proposals and others covering substitutions of geared hand brake wheels, and the possibility of producing a standard type of wheel for friction clutch brakes.

### Periodic Maintenance

The committee believes that geared hand brakes would be more efficient if they were dismantled periodically to correct any adverse conditions which might exist on concealed parts inside of the housing. Time limits for such periodic attention which would be generally acceptable to car owners are being investigated. At present it is felt that such attention might be given at every other C.O.T.&S. of air brakes, or between 5 and 6 years.

It has been observed at various yards and at car builders' plants that hand brake unit housings have been welded to their support brackets as well as bolted or riveted. This practice should be discontinued as welding malleable iron reverts it to cast iron and it becomes brittle or cracks and breaks. When either malleable iron or open hearth steel housings are welded, burning them off destroys the housings unnecessarily.

The committee is preparing a proposed table for inclusion in the Interchange Rules to cover permissible substitution of various wheels on approved geared hand brakes, which is to be reviewed with the engineering committee of the geared hand brake manufacturers before submission to the arbitration committee.

(The report also contained a table of lubrication data on all approved geared hand brakes showing where and how to lubricate each. The table is not included in this abstract—Editor.)

The report was presented by a committee of which H. B. Wolfe, engineer car construction, AT&SF, was chairman.

## Discussion

The discussion of this report centered about the list of approved hand brakes, with three members feeling it is too long. One said that the committee should not merely keep adding brakes to the approved list, but should remove old ones as well. Another felt that the manufacturers barely satisfy minimum requirements to keep costs down, while some real design work is needed to produce a good hand brake at reasonable cost. His road has built a tester on which hand brakes are cycled to destruction to show manufacturers the weak points of their equipment, and his road now buys all hand brakes from only two manufacturers except for special installations.

Improvement in hand brakes, said one member, would make it unnecessary to dismantle the brakes more often than every 15 or 20 years. Even now the interval could be ten years if supplemented by checking on the rip track.

## Tank Cars

During the past year the committee was called upon to give consideration to a total of 490 dockets and applications for approval of designs as follows: 201 covered designs, materials and construction of 6,393 new shipping containers, for mounting on new cars or replacements on existing cars as tabulated.

Four applications covered the construction of four new car structures, one for the mounting of each of the following existing type tanks: Class ARA-III, Class ICC-105A300-W, Class ICC-103-W and Class ICC-105A300. A fifth application covered the construction of 15 TMU multi-unit cars for the mounting of 15 Class ICC-106A-500 or ICC-106A500-X one-ton shipping containers per car. There were also 238 applications that covered alterations in, additions to, or conversions and reconditioning of 2,313 tank cars or shipping containers; and 46 applications covered tank car appurtenances or materials.

On recommendation by the committee and concurred in by the Bureau of Explosives, the I.C.C. issued Special Permit No. 780 to authorize for experimental service trials, the transportation of hydrogen peroxide in Class ICC-103A-AL-W tank cars, marked BECX 890 and 891. These cars are in full conformance with above specifications, except that their tanks are fabricated of a newly developed aluminum alloy, designated as XB54S, in lieu of aluminum alloys presently authorized for this class of tank.

Upon recommendation by the Committee and concurred in by the Bureau of Explosives, the I.C.C. effective October 25, 1952, adopted specification Class ICC-104A-AL-W, covering tank cars having fusion welded aluminum tanks, and published same as Section 78.294 of the I.C.C. Regulations for the Transportation of Explosives and Other Dangerous Articles, and authorized tank cars conforming thereto, for the transportation of flammable liquids of nature defined therein. (These specifications appear as Appendix "A," not included in this abstract—Editor.)

Table I—Number and Classes of New Shipping Containers

Class	No. of Tanks
ICC-103-AL-W (Fusion welded seams).....	51
ICC-103A-AL-W (Fusion welded seams).....	9
ICC-103-W (Fusion welded seams).....	2,290
ICC-103A.....	1
ICC-103A-W (Fusion welded seams).....	118
ICC-103B-W (Fusion welded seams).....	66
ICC-103C-W (Fusion welded seams).....	8
ICC-104A-AL-W (Fusion welded seams).....	53
ICC-104-W (Fusion welded seams).....	60
ICC-104A-W (Fusion welded seams).....	74
ICC-105A300-W (Fusion welded seams).....	2,623
ICC-105A500-W (Fusion welded seams).....	21
ICC-106A500-X (Fusion welded longitudinal seams).....	945
AAR-201A35-W (Fusion welded seams).....	5
AAR-205A300-W (Fusion welded seams).....	50
TMU Multi-unit.....	15
Car structures for the mounting of existing tanks.....	4
Total.....	6,393

#### **Amendments to ICC Specifications**

The committee recommended amendments to the following ICC specifications for tank cars, which were concurred in by the Bureau of Explosives and adopted by the ICC; Specifications Class ICC-105A300, ICC-105A400, ICC-105A500 and ICC-105A600, paragraph ICC-9(a) and Specifications Class ICC-105A300-W, ICC-105A400-W, ICC-105A500-W and ICC-105A600-W, paragraph ICC-11(c), covering gaging devices, sampling valves and thermometer wells; and Specification Class ICC-104A, paragraph ICC-12(a) and 12(b) and Specification Class ICC-104A-W, paragraph 11(a) and 11(b), covering Venting, Loading and Discharging, Gaging and Sampling Devices. Installation of the equipment covered above is now optional, not mandatory, but where

installed must be of approved design.

Other amendments recommended and adopted were to Specification Class ICC-103B-W, paragraph ICC-6(a) to authorize repairs to rubber lined fusion welded tanks by means of riveted patches; Specification Class ICC-105A300-W, paragraph ICC-10(b) to authorize installation of manway covers of nickel where required by lading transported; also to Specification Class ICC-103, paragraph ICC-19(a); Class ICC-104, paragraph ICC-19(a); Class ICC-104A, paragraph ICC-19(a); Class ICC-105A300, paragraph ICC-15(a) and ICC-15(b); Class ICC-105A400, paragraph ICC-15(a); Class ICC-105A500, paragraph 1CC-15(a); Class ICC-105A600, paragraph ICC-15(a); Class ICC-103-W, paragraph

(Continued on next page)

## **Co-operation Between A.A.R. Divisions**

**By V. N. Dawson**

Although there exists already a measure of departmental cooperation, more of it can bring about better results for the railroads. For the most part, our problems are your problems; likewise, to a great extent, your problems are ours. One of our duties is to see that materials are on hand when needed for repairing equipment so that the repairs can be made quickly and economically. However, our duties do not end there.

Our managements want us to keep enough material on hand, but not to the extent that the assets are disproportionately represented by materials and supplies. Wages, taxes, and dividends cannot be paid with materials; we need money for that. We cannot buy urgently required items with materials already on hand. Moreover, slow-moving materials and items held for protection of vital operations or for long range programs are not the assets they may appear to be. In this day and age, with the passing of the steam locomotive and with the improvements and changes being made in the recently acquired diesel locomotive, it is not unusual to find materials made obsolete almost over night.

There can be no reasonable doubt that the purchasing and stores departments should be independent. Every department has a specific function: the engineering department provides our highways of steel; the mechanical department keeps the equipment rolling; the traffic department develops new business; the purchasing department buys the needed materials at the lowest prices consistent with quality; the stores department arranges to maintain and care for an adequate supply of needed items.

The first duty of the stores department is to order supplies, but not in quantities that tie up funds which might otherwise be available for improvements, wages, taxes, and dividends. The second duty is to store, protect, and issue such supplies efficiently. The third duty is to see that scrap produced on the railroads is properly handled, classified, and disposed of to the best advantage.

The first duty of the purchasing department is to purchase materials at the best price consistent with quality and the needs of the using departments; the second, to purchase such materials in quantities that will insure their being obtained at the lowest price consistent with proper inventory; and the third, to purchase them from such sources as will avoid any unnecessary freight charges

or even backhauls over the purchaser's own railroad. The fourth duty is to sell scrap and any other material no longer of use on its own road at the best price obtainable.

One of the greatest bugaboos we have to contend with is the apparent idea held by using departments that materials can be ordered today and secured tomorrow. It takes months to get certain items of material; therefore, your programs must be carefully planned in advance to avoid delays due to a lack of vital materials. Few railroads have continuous programs where the materials can be ordered on an even flow basis. This is unfortunate, since the savings that are possible under such an arrangement are enormous. High inventories are as much your responsibility as ours; often more so.

Too little consideration is given to the disposal of scrap. Apparently, most using departments are interested chiefly in getting the scrap off the property rather than in obtaining the most money for it. The way scrap is prepared and the time it is sold can have a tremendous effect upon the price obtained for it.

To bring about closer cooperation between A. A. R. divisions that will result in better things for the railroads, it has been recommended that there be more collaboration between our working committees. To accomplish this, it has been arranged that you will have representatives on some of our committees and we will have representatives on some of yours. In this way, each division will know what is going on within the other division and will thus avoid duplication of effort. Ideas that can be mutually advantageous to both divisions and to the railroads we represent will be instantly known and can be put into operation so that savings can be made immediately, not years after the ideas are conceived.

It is hoped that the builders will recognize at least the minor differences and difficulties encountered in the purchasing, stores, and mechanical departments, and will do their utmost toward reducing the stock and adhering to standards already established on new models that they will build. Collaboration between the committees of the divisions would be very helpful in standardizing or reducing parts needed to provide a reasonable inventory and to enable the purchasing department to secure items on a quantity basis, to insure prompt delivery and at a reasonable cost.

ICC-19(a); Class ICC-104-W, paragraph ICC-19(a); Class ICC-104A-W, paragraph ICC-19(a); Class ICC-105A300-W, ICC-105A400-W, ICC-105A500-W and ICC-105A600-W, paragraph ICC-19(a); Class ICC-103-AL-W, paragraph ICC-19(a); Class ICC-104A-AL-W, paragraph ICC-19(a). These latter amendments required inspection of interior surface of tank heads when tanks are retested. Tank retests for Class ICC-104A, ICC-104A-W, ICC-104A-AL-W, and ICC-105A and 105A-W series were authorized to be performed at ten-year, instead of five-year, intervals effective December 31, 1952.

#### Amendments to AAR Specifications

The committee recommended amendments to the following AAR specifications which were concurred in by the Bureau of Explosives, accepted by the General Committee and authorization granted to make same effective: Section D—Procedure, paragraph 1 (g) to improve and simplify procedure followed in processing AAR tank car applications for approval of designs; Section E—Application for Approval, new Note 4 to define procedure to be followed in proposed repairs to manway covers of Class ICC-104A and ICC-105A series tanks; and Specification Classes ICC-103-W, ICC-103AL-W and AAR-205A300-W, paragraphs AAR-6 (j-13) and ICC-110A500-W, paragraph AAR-5 (j-13).

At a meeting held January 14 and 15, the committee either disposed of or progressed 32 special subjects previously docketed.

The report was presented by a committee of which J. E. Keegan, chief car inspector, Western Region, PRR, was chairman.

#### Specifications for Materials

The committee recommended that changes in the following specifications be submitted to letter ballot:

M-105 (blooms, billets and slabs for forgings) to take the place of the reference to the requirements of A.S.T.M. Specifications A-273-T.

M-116 (structural steel shapes, plates and bars) to make the requirements consistent with commercial practices and to revise the "Permissible Variations in Lengths for Bars and Bar Size Shapes."

M-122 (hot rolled carbon steel bars) to be consistent with commercial practices.

M-126 (carbon steel forgings) to change the microscopic test requirements.

M-131 (alloy steel blooms, billets and slabs for forging) to replace the A.S.T.M. reference.

M-201 (steel castings) to revise the type electrode to be used for welding grade C castings and, by agreements between purchaser and manufacturer, for grades D and E.

M-202 (truck bolsters) and M-203 (cast steel truck sideframes) to permit welding without pre-heating on sections 1 in. or less for grade C castings.

M-301 (iron and steel chain) to revise elongation requirements in section II.

M-403 (cast iron wheels for locomotives, tenders and cars) for better clarity and simplicity.

M-405 (iron back journal bearings), a proposed specification.

M-601 (air brake and train air signal hose) to reduce the tensile strength of the tube and cover below the requirements of M-601-49 but to increase them over EM-601-52, and to coordinate the specifications with the practices of the rubber manufacturing industry.

M-603 (wrapped and braided cutting and welding hose) to rescind the emergency specifications.

M-912 (triple valve oil) to indicate "the latest revision of the A.S.T.M. methods" rather than to specify the year to eliminate the need for frequent revision.

M-917 (Journal roller bearing grease) to include suitable specifications.

Editorial changes were made in the following specifications:

M-101 (non-heat-treated carbon steel axles) to correct the marking diagram shown as Fig. 1 to carry out the original intent of these specifications which was to cover only three grades of axles.

M-501 (lined journal bearings) to change the spread of the acceptable zinc content to between 2½ and 4½ per cent. Manual

page D-24 was changed to make mandatory the assignment of lot numbers and to mark bearings "Satco" when so lined, and to reinstate notes A through D formerly shown on ED-24-1945.

E-M-905 (new waste for journal box packing) to permit threads less than 6 in. long up to 8 per cent by weight in the waste.

#### General

Progress was reported on the proposed specification for diesel lube oil and on the tests being conducted on some roads with fuel of high sulphur limits and low cetane numbers.

At a meeting of the joint committee on journal lubrication research, the statement was recorded that the committee did not believe that lubrication of solid bearings and car journal bearings was an extreme pressure problem, but that oiliness or film forming additive may be beneficial. Polar compounds with sulphur or chlorine were believed beneficial, phosphorus optional and rust inhibitors beneficial. The director of mechanical research was requested to investigate to prove or disprove this opinion, and he advised that a machine to do this will soon be ready for trial.

A test of the 40-42 second at 210 deg. F. car oil with an additive in place of EM-906 All Year Oil of 50-55 second at 210 deg. F. without additive, was made on three roads. One discontinued it because no noticeable benefits resulted. The other two had conditions not sufficiently stable to evaluate this oil and are continuing to use it during 1953.

A review of an interim report on Research Project No. 5—"Laboratory Investigation of Extreme Pressure Additives for 'Light' Car Journal Oil" showed very briefly that (1) the use of MS-40 additive had no detrimental effect to the waste pack or bearings and (2) that the lighter oils tended to vaporize quite early eventually resulting in increase in viscosity. Report No. f8700 on the relative loss of oil in journal boxes between the proposed light oil and the A.A.R. emergency specification oil showed briefly that the oil lost due to vaporization of the lighter oil (40-42 sec. at 210 deg. F.) is a considerable factor compared to the present specification oil.

The report was presented by a committee of which W. F. Collins, assistant chief-engineering services, N. Y. C., was chairman.

#### Discussion

A suggestion was made from the floor that the Mechanical Division specifications should be complete in themselves so that users would not find it necessary to refer to other specifications which might not be readily available.

In answer to another suggestion, the committee chairman said that the term "injurious defect" in the axle specifications would be clarified and that the strength test specified for cast iron should be used in M-501 as more railroads are going to be asked to conduct grease acceptance tests.

Another member suggested that the preheat clause for welding high-tensile castings be revised to eliminate preheat under certain conditions of thickness, carbon content and hardenability.

#### Car Wheels

The report of the Committee on Wheels contained some proposed revisions of chilled-wheel specifications and brief reports on the AAR X-2 cast-steel wheel with 1.50 per cent carbon content, 126 of which were in service on 31 cars up to February, 1953, and the AAR X-3 cast-steel wheel with .75 per cent carbon content, 100,000 of which have been authorized for interchange service.

The Wheel Committee concurred in a recommendation included in the Car Construction report that in order to alleviate breakage of composite tools with centering axles the recommended practice for axle centering shown on Manual page D-4B be revised to provide a 7/16-in. diameter for the lead hole in place of the 5/16-in. dimension now shown. This was referred to letter ballot.

#### Wheel and Axle Manual

In order to correlate Paragraph 233 and Rule 356 (c) and to clarify the identification of wheel mounting records and consequent handling, the committee recommended modifications in the Wheel and Axle Manual for adoption by letter ballot, as follows:

**Proposed Form—233.** The graphic wheel press record charts must be marked as stated in Rule 356 (c).

(c) The gates must always be used for every mounting operation. The recording gage must take a complete wheel fit pressure diagram of the type shown in Fig. 116 for each wheel mounted. The diagram for the mounting of each wheel shall be marked to show the identifying wheel number. It shall also be marked to show the type of wheel and nominal wheel seat diameter for each record, or at least when there is a change in the type of the nominal wheel seat diameter of the wheels being mounted. Fig. 116-A shows how diagrams must be marked. The type of wheel and the nominal wheel seat diameter may be designated by symbols provided their use will not cause confusion. The records must be available to A.A.R. inspectors.

During mounting, pressure gage must be watched, and if pressure is outside the limits given in Table, Fig. 115, diagrams showing such misfits must be plainly marked. Misfit mountings must be corrected. The subsequent mounting record will prove that the misfit wheel was properly remounted.

The proposed new Figure 116-A was included in the report.

#### Magnetic Particle Testing of Axles

The committee recommended, as a letter ballot item, that a new Paragraph (p) be added to Rule 355 of the Wheel and Axle Manual as follows:

"(p) Pully drive axle shall have pulley mounting removed and body of axle magnetic particle tested when such pairs of wheels are processed through wheel shop for restoration of tread and flange contour."

**Reasons:** As a safety measure to insure detection of defects located below the pulley on the axle when mounted wheels are turned at the wheel shop.

#### Mounting Pressures for Steel Wheels

The attention of the committee was directed to the fact that Manual Plate F-128 does not show all possible wheel fit diameters between 6 and 14 in. In order to correct this discrepancy and have such diameters in the same form as the micrometer measurements taken from wheel seats, the committee offered, as a letter ballot item, a revised table, included in the report, showing mounting pressures for the above mentioned range of diameters. This table was based upon a factor of 13 tons per inch of diameter expressed in the nearest 5 tons with an allowed variation of 20 per cent over or under.

#### Wheel Shop Practices

The committee offered a recommendation, as a letter ballot item, that a revision be made in the Wheel and Axle Manual to permit (1) the use of car wheel boring mills on which the wheel is held stationary and the boring bar revolves and (2) one-pass boring of cast iron wheels.

The report was presented by a committee of which E. E. Chapman, mechanical assistant, AT&SF, was chairman.

#### Discussion

In the discussion the question was raised if the tread shelling of the new 40-in. wrought-steel wheels for diesel service in some instances was perhaps due to the relatively thin 1½-in. rim thickness.

A representative of the wrought steel industry said that even one wheel failure is one too many and promised full cooperation in efforts to make wrought steel wheels as nearly perfect as possible. At the same time, he said a study shows an average service life per failure for this type of wheel of about 500 million miles.

(Continued on next page)

## Find College Men Who Want to Railroad

By Chairman Cover

Research in the railroad field today is of tremendous importance and under the direction of our present director of research, with the laboratory facilities in Chicago, we are in a better position than we have been for many years and at the same time, must give credit to the railway supply men and manufacturers of railway equipment who, in turn, have contributed to the progress of improvement through their own research and other assistance in working with the railroad mechanical people.

I want to diverge from the general subject that relates to equipment and talk to you briefly about one subject that I think is of paramount importance in the railroad field, not only in the mechanical department but in all departments.

None of us like to admit it, but each of us becomes a year older every year and as time moves on, one of the biggest challenges that each railroad officer faces is the training of a proper group of employees to fill in and move into key positions. Younger men, of course, are the nucleus of this group and practically every railroad has some plan whereby college or university graduates are recruited and after proper training assigned to minor supervisory positions in order to measure their ability to direct and work with other people. The measure of their performance usually determines the rate at which they can be promoted to greater responsibilities.

On the Pennsylvania, we have set up a training course for engineers both in the mechanical and maintenance-of-way departments. Top officers of our railroad visit only universities and colleges which we consider ac-

credited groups of schools and interview and discuss railroad problems with students who are considering railroading as a career.

It is not a difficult problem to sell this idea to most of the people interviewed since railroading promises excitement, travel, new interests, new places and new people. Railroading is a staple industry which spells security. Railroading will be necessary as long as the United States needs transportation. Railroads offer a tremendous opportunity to young engineers and in spite of what some of our friends are doing to attract young engineers to other industry, we are definitely of the opinion that the primary urge must be with the individual and if he is interested, our procedure is rather pleasant.

We bring him in and give him an opportunity to meet with and talk to some of our top officers. The whole picture is not painted in brilliant colors. There are some tough sides to railroading and some hard work but once the individual has displayed interest, the tough side seems to become a challenge and our procedures to date have indicated to us that there is still a great deal of interest on the part of engineering students in the railroad industry today.

All of you are faced with the necessity of considering younger men for important assignments. Give these younger men an opportunity, even though in the first few months of an assignment they may make some mistakes. The challenge is here. None of us can go on forever and the measure of our younger men will determine what positions they can fill for us in the future.

In other words, in spite of the notable safety of passenger service, it is really safer to be a wrought-steel wheel than a passenger.

A representative of the Association of Manufacturers of Chilled Car Wheels said the new cast-steel wheels will probably not replace chilled-iron wheels for a good many years, as wheels of this type are now the best ever made and further improvements may be expected.

## Safety Appliances

The Committee on Safety Appliances handled 163 applications involving designs for safety appliance details. The report recommended approval for the Apex Tri-Lok, Type A-1 metal running board and reported to the members that the matter of the revision of the publication entitled Maintenance of Air Brake and Air Signal Equipment on Locomotives and Cars must, of necessity, be held in abeyance for the time being.

The joint committees are following the performance of 398 lightweight Illinois Central hopper cars equipped with ABLC brake equipment. Since the last report this committee has collaborated in the inspection of the equipment on a number of these cars and takes exception to certain features of this type of equipment which are not acceptable in the present form.

## Car and Locomotive Lubrication

The report of the Lubrication Committee covered numerous phases of one of the major problems confronting railroads today. Roller-bearing lubricants were covered and further road service and laboratory tests proposed. Other subjects included in the report were journal-box lids, spring-type packing retainers, and a number of proprietary lubrication devices.

### Revision of A.A.R. Lubrication Manual

The following modifications were recommended as letter ballot items, for inclusion in the next revision of the Lubrication Manual:

#### Section II, Par. (a).

*Proposed Form*—(a) Packing must consist of all new, all renovated or a blended mixture of new and renovated waste.

*Reason:* Account unnecessary and found to be confusing in some instances.

#### Section V, Par. (c).

*Proposed Form*—(c) Boxes shall be inspected for cracks which might cause oil leakage, and be removed if found in leaking condition. Riveted type of pressed steel journal boxes found to be leaking oil should likewise be removed.

*Reason:* To provide for the removal of journal boxes having defects which cause the leaking of oil.

#### Add Section V, Par. (j).—Modify Item 5 as follows:

*Proposed Form*—When lining is spread over side  $\frac{1}{8}$  inch or more below bottom edge of side wall of brass, either side, regardless of length of such spread, provided less than  $\frac{1}{8}$  inch of lining metal remains. However, where this same condition exists and  $\frac{1}{8}$  inch or more of lining metal remains and the bearing is not otherwise condemnable as specified herein, a new bearing must be applied or the lining must be trimmed off on both sides to original distance from edges and replaced on the same journal for which charge may be made per item (\*) of Interchange Rule 107.

\* Appropriate item and allowance for this work to be incorporated in Rule 107 by the Price Committee based on time studies covering the time consumed.

*Reason:* Summary and analysis of statistics obtained from replies of Member Roads to A.A.R. questionnaire regarding causes of hot boxes has definitely indicated there is much less likelihood of hot boxes occurring in cases where bearing has become worn in and fully seated on Journal. Therefore, anything which can be done to retain fully seated journal bearings in further service will reduce the number of hot boxes.

If the above recommendation is approved by letter ballot, similar changes will be made in Section (j) of Interchange Rule 66 by the Arbitration Committee.

#### Section VII, Par. (c).

## 1955 MEETING AT MONTREAL

In the report of the General Committee is the announcement that the 1955 meeting of the Division will be held at the Mount Royal Hotel, Montreal, Que.

The 1954 meeting will be at the Hotel Sherman, Chicago, on June 29, 30 and July 1. The 1954 meeting of the Electrical Section of the Mechanical and Engineering Divisions will be held at the same time and place.

*Proposed Form*—(c) All packing shall be removed; all journal bearings and wedges shall be removed and inspected; all boxes shall be cleaned and repacked; missing or defective dust guard plugs shall be renewed. Where packing retainer devices are in boxes, care must be taken in their removal to prevent damage, and same must be reapplied if in serviceable condition; if defective or missing same should be renewed in kind if standard to car, except long spring type retainers in separable bolted type journal boxes.

*Reason:* Long spring type retainers should not be perpetuated in separable boxes.

#### Section VII, Para. (f).

*Proposed Form*—(f) No change shall be made in the stencilling until all boxes receive complete attention in all details.

#### Section IX, Para. (d).

*Proposed Form*—(d) Feel along both edges of bearings with waste grab hook to detect waste grabs, spread or broken lining, or rough journal. If any of these conditions are found, bearing should be removed to permit of inspection and defective condition corrected.

*Reason:* To clarify the intent and to eliminate the word "cracked" which is in conflict with Section V, Para. (j) and Interchange Rule 66 (j).

#### Section IX, Para. (j).

*Proposed Form*—(j) If necessary in cold weather to add cutback or thinner oil, hot car oil, or thin oil having a flash point of 300 deg. F. or above, may be used. The use of kerosene oil, or any oil with flash point below 300 deg. F., is prohibited. However, the restricted use of kerosene as a journal swabbing oil, applied with a swab and not poured into journal boxes is permissible.

*Reason:* To provide for the use of kerosene in cold weather on journals only.

Progress reports were included on the relation of spring plankless trucks and excessive lateral to the hot-box problem; the use of plastic cement to seal dust guard openings and committee action was proposed in the matter of investigating the RS journal stop and packing retainer and the Snug Fit journal lubricator for use in conventional journal boxes.

Material specifications were proposed for the Laudig Iron-Back bearing, now approved as an alternate A.A.R. standard. The Empire journal lubricator has been approved for 1,000 car sets in interchange. Not enough service performance has been obtained on either the Hennessy or Jeffers journal lubricators to permit proper evaluation.

The report was presented by a committee of which R. E. Coughlan, chief metallurgist and engineer tests, C&NW, was chairman.

## Discussion

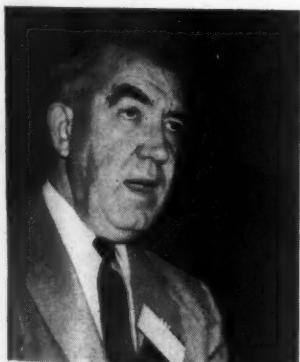
Reductions in hot boxes in some instances were credited in the discussion to better observance of A.A.R. rules, holding trains for proper servicing, and providing enough box packers and oilers to give journal boxes necessary attention in departure yards. Truck maintenance was said to be fully as important as car body maintenance. One member suggested that spring packing retainers be made mandatory on interchange cars. Their success depends upon there being enough packing in the box so that the springs will not depress it away from the journal, and the application such that the collars will not be cut. Some of the members are favorably impressed with the proprietary lubrication devices, and consider them well worth following up. One member expressed the belief that tight lids and dust guard seals are the key to the success of these lubricating devices.



Members of the Section at the opening session listening to the address of H. T. Cover.

## Electrical Section Meets With Mechanical Division

*Year's work, done in nine months, produces exceptionally fine program. Discussion of the sixteen technical reports runs overtime.*



The need for a strong, co-ordinated Electrical Section, said H. T. Cover, has been achieved.

THE second annual meeting of the Electrical Section Engineering and Mechanical Divisions, Association of American Railroads, was held jointly with the annual meetings of the Mechanical and Purchases and Stores Division, A. A. R., Atlantic City, June 24-26.

The first session of the Electrical Section was opened by Chairman C. A. Williamson, electrical engineer, Texas & New Orleans. The industry which the section serves, he said, is a wonderful system which is big business representing \$37 billion in investments in railroads in Cuba, Mexico, Canada and United States.

Using a story as an illustration, he said, that in some

professions, apprentices learn their work in a few weeks whereas in the railroads' electrical department change and development is constant. So many are these changes, he said, that any one man must have digests of information. The A. A. R., he said, attempts to provide these. He summarized the reports to illustrate to what extent they served as digests. These, he said, are the cream of available information. He concluded by thanking the members of the committees for compiling excellent reports in three months less than the usual time.

R. I. Fort, vice-chairman and electrical engineer equipment, Illinois Central, presented the chairman's badge to Mr. Williamson. W. M. Adrian, of Luminator, Inc., representing the Railway Electric Manufacturers' Supply Association, presented Mr. Williamson with an engraved gavel in appreciation of Mr. Williamson's stewardship of the Section.

H. T. Cover, assistant vice president, Pennsylvania, and chairman of the Mechanical Division, made the keynote address. "I have appreciated, for some time," he said, "the need for a strong coordinated Electrical Section, and I congratulate you on that achievement. I would also at this time, like to compliment your very able secretary, Steve Marras, on the excellent job that he has done in getting your section ready for this annual meeting."

He said it is his understanding that the section will



R. I. Fort  
Vice Chairman



C. A. Williamson  
Chairman



S. W. Marras  
Secretary



W. M. Adrian, representing  
the R.E.S.M.A., presents an  
engraved gavel to Chairman  
Williamson.

meet with the Mechanical Division in Chicago next year, and that consideration is being given to the possibility of meeting again with the Mechanical Division in Montreal in 1955. This, he spoke of as being desirable, because of the close tie-in between the Electrical Section and the Mechanical Division. He listed the many applications of electrical equipment including locomotives, passenger cars, shops, caboose power, rectifier type electric locomotives, lighting, electronic controls, etc.

Mr. Cover concluded by saying: "Again, let me repeat that I welcome you here as a very necessary part of the A. A. R. organization, and I am sure that your group has a great future in the A. A. R. picture. A review of your roster of committees and their assignments clearly shows that you have plenty of work ahead of you in the future, and you can be assured that the Mechanical Division and its membership stands ready to help at all times. I wish you all the best of luck and predict that yours will be a fast growing organization in the future."

In his secretary's address, S. W. Marras reviewed the history of the section and the work done by the Committee of Direction. This committee held three meetings in the 1952-53 period and all of the complications arising from the joining of the two former electrical sections have been disposed of. The next meeting of the Section, he said, will be held June 29, 30 and July 1, with the Mechanical Division in the Hotel Sherman, Chicago, without exhibits. The 1955 meeting will be held in Montreal.

#### Election of Officers

Officers elected were as follows:

Chairman: R. I. Fort, electrical engineer, equipment, Illinois Central;

Vice Chairman: K. H. Gordon, assistant electrical engineer, Pennsylvania.

Committee of Direction, for one year: S. B. Pennell, assistant engineer, New York Central, and S. R. Negley, electrical engineer, Reading. To serve for two years: C. R. Bland, assistant electrical engineer, rolling stock, Chesapeake & Ohio, and J. O. Fraker, electrical engineer and diesel supervisor, Texas & Pacific. To serve three years: R. F. Dougherty, general electrical and air conditioning inspector, Union Pacific, and H. P. Wright, assistant to electrical engineer, Baltimore & Ohio.

A letter from J. A. Andreucetti, secretary emeritus of the Section, was read by the chairman. This is the first meeting which Mr. Andreucetti has missed since 1908. The association gave him a rising vote of thanks for the service he has rendered.

L. B. Curtis, assistant engineer, office of electrical engineer, Pennsylvania, reported on the collaboration of the Electrical Section with other associations.

#### Air Conditioning and Refrigeration

The report of the Committee on Air Conditioning and Refrigeration was presented by A. E. Voigt, car lighting and air conditioning engineer (retired), Atchison, Topeka & Santa Fe, assisted by the several committee chairmen.

The basic requirements of air conditioning are outlined in the report in such a way as to establish a goal for both operators and designers.

Various means of avoiding changes in humidity with changes in cooling load have been developed by the manufacturers. Those made by Frigidaire Division (General Motors Corp.), Safety Car Heating & Lighting Company, Trane Company and Waukesha Motor Company are described in the report.

In response to one assignment, the committee has worked up a general specification for heating of passenger train cars.

Performance specifications for air filter servicing equipment are also included.

A section of the report devoted to waste product heating states the Budd rail diesel cars are kept comfortable at minus 40 deg. F. with waste heat from the engines when both engines are running.



Veteran A. E. Voigt reported on air conditioning and refrigeration.



S. R. Negley considers a question from the floor.

Eleven diners and coffee shop cars on an eastern railroad having temperature control with undercar power plants using jacket water and exhaust gas heat have given excellent service with a minimum of maintenance.

The same road, the report states, equipped a diner having Minneapolis-Honeywell temperature control with two undercar diesel-electric plants which supply all the electrical energy for air conditioning, ventilation, fluorescent lighting and all kitchen appliances. Waste product heat obtained from these sets is utilized for heating the car and heating service water in the kitchen. The system is described in the report.

Also described are liquid fuel-fired heaters for use on business cars as standby heating systems.

One section of the report consists of complete specifications for mechanical refrigeration of water cooler units.

On the subject of hermetically-sealed units for air conditioning and refrigeration, the report states, that while little has been done since few cars have 220-volt a.c. power, one manufacturer now has a hermetically-sealed compressor unit available. Two existing installations, respectively on a diner and a coach are described.

A major part of the report is a summation of recommended practice for the maintenance of fresh and recirculated air filters at maintenance terminals.

The report is concluded with a study of dynamic grilles for use on condensers on air-conditioned cars. These grilles which are placed on surfaces, edgewise to the motion of the car, are so shaped as to deflect heavy dirt particles before they are drawn into the condenser.

The discussion of the report was started by W. S. H. Hamilton (N.Y.C.). The report indicates that there are relatively few railway passenger cars which have temperature and humidity control and he asked if the approximately 1,000 cars on the N.Y.C. having split evaporators and two-speed compressors fell within the definition. J. L. Christen (Pullman Company), observed that if two steps are adequate, there is no need for four. Mr. Hamilton replied that the two-step control is so much better than the on-and-off method that there has seemed to be no need for a change. R. F. Dougherty (U.P.) said it had not been decided on the Union Pacific that the two-state control is completely satisfactory for all parts of the country. T. J. Kenny, of Fulton-Sylphon Company, spoke of using reheat for optimum air-conditioning results. Mr. Christen said it required more power from systems which are scarcely adequate. J. L. Swarner (Pullman-Standard), referred to the Milwaukee dome cars which have six stages of control.

There followed technical discussion which amounted to going over the report with a fine-tooth comb in which the findings of the committee were adjusted to suit the consensus of the section membership.

There was general agreement among those who spoke that positive pressure is desirable in cars as negative pressure pulls the cool air out through cracks and open doors, and pressurized cars are easier to keep clean. The relative merits of bypassing and reheating were resolved with the general conclusion that reheating is desirable but that it adds complications and is more difficult to maintain. The major goal to achieve is reliability, rather than the ultimate in comfort. Cycling was felt to be poor practice as the coil gets full of water, discharging it to the air which it must be taken out of. One member said that the first problem is to get enough cooling capacity, then worry about cycling. It was generally agreed that if you split the evaporator you must modulate the compressor.

## Corrosion Resisting Materials

The report of the Committee on Corrosion Resisting Materials was presented by Chairman S. R. Negley, electrical engineer, Reading.

Tests with four different protective coatings which were started in a railroad tunnel in 1948, showed one of the coatings with a cottonseed gum base to be better than the others, but since steam locomotives have been replaced by diesels the corrosion problem has largely disappeared.

The most effective means which the committee has found for protecting catenary supporting structures is a preservative similar to that used for oiling rail and track fastenings. It is an oil having a high asphalt content and is basically a distillation residue from asphaltic base petroleums.

Two electrolytic methods of rust removal made available respectively by the Bratoc Corporation, London, England, and Enthone, Inc., New Haven, Conn., are described. The part to be cleaned becomes the cathode in the bath and the nascent hydrogen formed removes the rust. Reversal of current restores the original color of the metal and assists in normalizing any tendency to hydrogen embrittlement.

Creosote treatment of wood poles has so increased their life that it may now be several times the life of the pole line hardware. The cost of the hardware is only a small part of the cost of its replacement and the report states that a number of utility companies are replacing carbon steel fittings with those made of a high-strength, low-alloy steel which has a corrosion resistance of four to six times that of the carbon steel.

Discussion was opened by L. B. Curtis (P.R.R.) who said that in inspecting some of the asphalt paint used on the New Haven, he found that results were excellent and said it will be tried by the Pennsylvania.

W. S. H. Hamilton (N.Y.C.) called attention to the fact that Battelle Memorial Institute has developed a protective coating for aluminum which will not break away on sharply curved surfaces. This, he said, is being tested in smoke jacks.

When asked if line hardware is being made of the new material referred to in the report, S. R. Negley (Reading) said it is available on order in minimum lots of 1,000. The fittings, he said, will probably soon become available as stock items.

## Automotive and Electric Rolling Stock

J. F. Partridge, assistant engineer, New York Central, presented the report of Committee No. 7 on Automotive and Electric Rolling Stock, assisted by several subcommittee chairmen.

Among new developments mentioned in the Report on Automotive and Electric Rolling Stock is a 1,600-hp. diesel-electric locomotive for export which has a two-axle, non-motored truck between two three-axle trucks.

New Baldwin-Lima-Hamilton developments include a six-axle, six-motor truck, a load regulator and a locomotive temperature control system.

Electromotive Corp. announcements include 800-hp. and 1,200-hp. switchers and road locomotives with regulated dynamic brakes, and two export locomotives with light axle loading.

A Fairbanks-Morse development reported is a 2,400-hp., type C-C locomotive with a 3,000-hp. dynamic brake.



J. F. Partridge pinch hits for C. A. Wilson.

New General Electric products mentioned double-deck banding for traction motors, improvements in gas-turbine locomotive design and a new insulation surge tester.

A Vapor development referred to is a hot-water heater which makes engine starting possible at minus 65 deg. F. and a 4,500-lb. steam generator for an all-electric locomotive.

Westinghouse activities listed include 100 Ignitron rectifier type m.u. cars being built for the New Haven a performance record of the Westinghouse gas-turbine locomotive, diesel locomotive electrical improvements and the steam-electric locomotive being built for the Norfolk & Western.

Nickel-Cadmium batteries, the report states, are now in service on 99 diesel-electric locomotives.

A study of interchangeability of diesel locomotive parts show that some progress has been made with electrically-controlled valves and with fuel pump motors.

A very comprehensive section of the report concerns the utilization of diesel-electric locomotives from the standpoint of electrical equipment limitations and characteristics for various types of service. It is general information of an educational character covering various features of the electrical equipment and control showing how they determine the operating characteristics of the locomotive.

A sub-committee is at present working to develop a standard location and arrangement of receptacles and jumpers on a diesel locomotive and one such arrangement is shown in a drawing.

To fulfill the requirements of a standard load indicator on a diesel-electric locomotive, the report recommends the use of two meters, one a fan-shaped 0-1500 scale ammeter to read 150 millivolts full scale, and one a round 0-2000 scale ammeter to read 200 millivolts full scale. Each instrument is to be mounted behind a plate marked to show the maximum continuous load and dynamic braking current for the unit involved.

Ground relay action has been investigated by a sub-committee with the purpose that its findings will aid builders in reducing relay action by improved insulation. It is the experience of most roads that a large percentage of moisture grounds will clear up if the equipment is allowed to operate with ground present until normal load operating temperatures evaporated the moisture.

The importance of keeping dust out of electrical control equipment is emphasized by the work of one sub-committee. Various types of enclosures are recommended and one railroad reports it has reduced the dust in main control cabinets at least 75 per cent by closing up the hole in the bottom of the cabinet.

R. F. Dougherty (U.P.) opened the discussion by saying that some nickel-cadmium batteries used on the Union Pacific had given a short life. Mr. Partridge replied that the New York Central has used them in switchers for two years and that they have given very good service.

Information on a new connector for diesel-electric locomotive traction motors was supplied by W. S. H. Hamilton (N.Y.C.). This connector secures all of the four leads in a single operation. An open end or box type wrench is the only tool required. The Westinghouse Electric Corporation has made up a working model and preliminary drawings of the connector are available.

Discussion on the ground relay was concerned chiefly with whether the switch to bypass its action was desirable and whether we can be sure we're right when we say "light moisture ground." It was pointed out that flashovers occur with present protection and that too many liberties cannot be taken in desensitizing ground relays. They are the only protection against flashovers.

Ground relay action was split into two types—that which would have caused a flashover, and that which should not have stopped the locomotive in the first place. The ground relay switch was included to remedy the second type of trouble. A point raised against the GR switch was that nobody on the locomotive is qualified to determine whether the cause of its operation was serious. Also, GR operation may be due to causes other than moisture.



H. C. Cross tells how to use electric power for heating.

## Electric Heating

The report of the Committee on Electric Heating was presented by Chairman H. C. Cross, engineer of electric construction, Baltimore & Ohio.

In its first assignment, the Committee on Electric Heating has prepared specifications for electric heaters for ballast under-track switches.

There is no accepted standard way of preventing freezing of diesel switchers when they are out of service during cold weather and the report describes electric standby heating equipment which will supply either 75,000 Z.t.u. or 120,000 B.t.u. per hour and which will sound an alarm if the heat supply should fail.

Frozen pipes may easily be thawed electrically. Rules of procedure for doing this are included in the report. Also described are a means for protecting hydrants with a 75-watt heater and a procedure for de-icing crane rails. Figures are included to show how much electrical energy is required to melt snow on sidewalks, platforms, driveways and other slab applications.

A new type of electric track switch heater is under development. It is a tubular element which is formed in a hair-pin shape with the ends brazed into a corrosion-resistant, water-tight terminal box. The report states that test heaters of this type have been installed on two mid-western railroads. The committee will make a study in an attempt to show by means of a curve, the cost per switch for electric snow melting depending upon the number of switches supplied by a single substation of average characteristics.

During the discussion, it was said that lengthy correspondence can be avoided by noting that all optional information is included in one place in the report for engineers and purchasing agents to refer to. One member thought the committee conservative in its description of immersion heaters based on his road's experience. The need to heat the lubricant was brought out, and the wattage recommended was a fourth as much per square inch as that for the water to avoid carbonization of the oil.

## Address by J. H. Aydelott

The opening session of the Section on Thursday was addressed by J. H. Aydelott, vice president, operations and maintenance department, A. A. R. He referred to types of motive power used 50 years ago when he served as fireman on locomotives without brick arches and on which all firing was done by hand. The output of locomotives now, he said, has been increased until they handle three times as much as they did in 1902, with speeds having been increased about 60 per cent. He stated that electric transmissions are used on nearly all modern locomotives and will



J. H. Aydelott predicted that the Electrical Section will have a place in the sun.

apparently be used on all new locomotives regardless of type. The circumstances, he said, will give the Electrical Section a place in the sun.

Mr. Aydelott voiced approval of the Electrical Section meeting with the Mechanical Division and congratulated the committees on producing such good reports in so little time. In recent years, he said, it has been especially important to keep inventories down and added that such standardization as can be effected by the Electrical Section will be an important contribution to smaller inventories and reduce costs. Diesel locomotives have effected a revolution and what we have now, may be outmoded tomorrow. The association, he said, will not overlook all types of development and he listed a number of recent developments which will require continued study by the section.

Magnetic amplifiers are described as one of the newest forms of industrial control. They are a static and rugged device with many potentialities. In railroad service, they have been applied to axle-driven car lighting generators and the report states that they may be applied to the control of main traction generators, engine speed governors, alternators and wheel-slip control.



B. A. Gallagher takes over for W. S. Heath.

### Radio and Communication Systems

A report of the Committee on Application of Radio and Communication Systems to Rolling Stock was presented by B. A. Gallagher, engineering draftsman, New York Central.

The work done by the Committee on Application of Radio and Communication Systems to Rolling Stock during the past year has consisted of co-ordinating the work of this committee with that being done by the Radio and Allied Communications Section of the A. A. R. One result of this collaboration is a tentative specification of the power requirements of radio-telephone equipment being installed on rolling stock.

One meeting was also held with manufacturers' representatives at which the problem of interchange of various components of radio-telephone equipment was discussed. It was agreed that mounting holes of mounting racks should be standardized as soon as possible.



C. R. Wadham describes new developments in motors and control.

### Motors and Controls

The report of the Committee on Motors and Controls scheduled for presentation on Wednesday was held over until Thursday morning. It was presented by Chairman C. R. Wadham, assistant engineer, Illinois Central.

The first part of the report of the Committee on Motors and Controls is given over to the application of photoelectric controls. Their applications are listed and their use for the control of outdoor lighting is described.

Detailed descriptions are also included of the Thyratron motor control and the Amplidyne and Rototrol.

Concerning diesel filling stations, the report explains that in most of the existing stations much oil is lost because of inadequate or improper fuel pump motor control. The report describes two methods of control which automatically stop the pump, which feeds four fuel tanks, when the last tank is full. One of these is electric and is controlled by a solenoid valve in each fitting nozzle. The other is mechanical, the operator setting a dial on his nozzle gage, when he starts to fill, to correspond with a gage on the tank which reads in gallons of oil from full.

To provide a good and fool-proof control for such turntables as are still in service, the Illinois Central has designed one which is described in the report.

Servomechanisms and their possible application to railroads are described. Applications of Selsyn motors for bridge operation are also discussed.

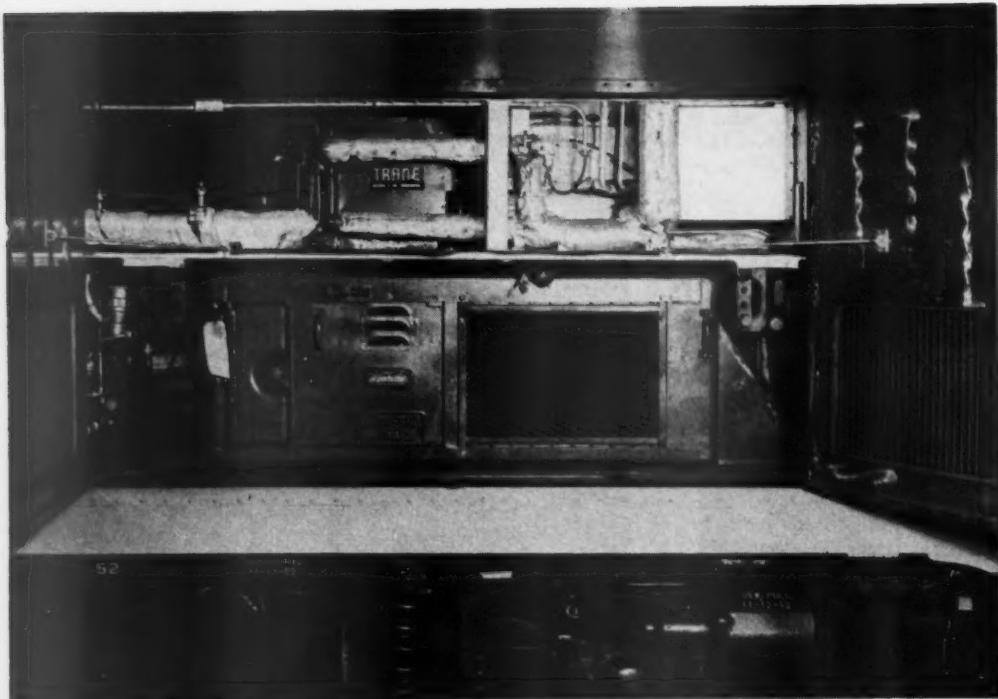
### Car Electrical Equipment

Committee Chairman S. B. Pennell, assistant engineer, New York Central, and the several subcommittee chairman presented the report of Committee No. 1 on Car Electrical Equipment.

The first subject assigned for study by the Committee on Car Electrical Equipment was diesel engine driven generator sets for individual passenger car power supply. These are required by increasing electrical loads as exemplified by diners and dome cars. There are 349 such sets in use, 119 of which are d.c. plants while the remainder generate a.c. power. It is the opinion of the committee that there is now a sufficient number of these plants in operation to determine their value to the railroads in the next few years. That section of the report which deals with this subject is a comprehensive statement of the present car power situation and is as follows: There seem to be enough undercar diesel engine generator sets in service that we should be able to have the answer to this problem within the next few years.

The electric loads are becoming so heavy, particularly on special cars, such as diners, dome cars, etc., that it becomes necessary to have some type of engine-driven power available. Electric diners will run 70 kw. connected load and full dome cars will run close to 50 kw. connected load. Whether this engine-driven power be in the form of a special power car at the head end of the train, or whether it be a unit installed in each car, is one of the very much argued questions of the day.

Concerning caboose power supply for communication equipment, the report states that engine-driven generators are now little used and that the usual source of power is the axle with either belt or gear and shaft drive, the latter having recently been made practicable with power taken from the end of an axle.



One of the two diesel-driven power plants mounted in compartments in C. M. St. P. & P. dome cars. They may be rolled out on extension tracks for inspection and certain kinds of servicing.

The development of the gear drives is described in considerable detail. Attention is also given to the use of dry battery-powered walkie-talkie sets. These have recently gained in favor since they allow a man on the ground to talk to the locomotive without having to return to the caboose.

A service charge of \$4.60 for the charging of passenger batteries of off-line cars was proposed by the committee in 1951. The reasons for this are reviewed in the report and it is recommended that this charge be continued until substantial reason for changing it is produced.

Requirements are outlined for electrical lockers which suggest a minimum of well-ventilated, well-lighted space with not less than 12 sq. ft. of floor area.

An idea for having electricians' keys for electrical lockers was scrapped in favor of pencil push type locks.

A wiring diagram in the report shows how loads may be fed from the train line with the battery disconnected from the circuits.

It is recommended that finely-machined surfaces when not in service be protected by light oil and one or more wrappings of pressure sensitive tape.

In past sessions, it has been suggested that 64 volts be adopted as standard for passenger cars but this report offers the opinion that new developments now in progress might be unnecessarily restricted by any such attempt to standardize.

Electrical grounds on passenger cars are a source of considerable difficulty and the report shows a ground indicating device for mounting on cars which has been developed by the Pullman Company.

Discussion was opened by L. C. Bowes (C.R.I.&P.), who explained how passenger car equipment must operate under very severe conditions. Diesel highway trucks, he said, operate from coast to coast, but over paved highways with drivers in attendance who can stop at filling stations and get trouble repaired. Cars, he said, require equipment which must run through without attendance. One of the critical factors for undercar power plants, he said, is good radiator cooling and added that these are practically a necessity for some cars with large loads.

R. F. Dougherty (U.P.) asked for information on types of fuel for undercar power plants. Mr. Bowes replied that on the Rock Island with about 35 units in service Diesel fuel is used exclusively. This he qualified by saying that Diesel fuel used by the Rock Island is good and does not have high sulphur content.

Asked to say something on the same subject, W. J. Madden (PRR) said that his road has 22 undercar power plants with two-cycle engines in service. These use only No. 1 Diesel fuel oil which, he said, is practically kerosene. A recent inspection showed almost no wear on these engines.

S. B. Pennell reads an excerpt from the report.



R. I. Fort (I.C.) said his road has only a few units. They use a good grade of No. 2 fuel oil without having had any difficulty.

In a general discussion which concerned the relative merits of 32 and 64 volt starters for undercar power plants, it appeared that the difference in voltage was unimportant insofar as successful performance is concerned. R. P. Lewis, Spicer Corporation, was asked for information on the gear drive for caboose power supply recently developed on the New York Central. He said we are getting to the end of our test work which has run more than five years. It may appear, he said, we have been over-cautious but believe we have now disposed of all difficulties. One unit which has operated for 400,000 miles was examined at 350,000 and found to be in good condition. It is expected that production models will be out in six months.

Some questions were raised concerning the section of the report which deals with service charges for battery charging since some batteries require a large amount of charge and others very little.

K. H. Gordon (PRR) said that while this is true, power cost is a rather small part of the cost of service.

Detailed consideration was given to the committee's recommendation which covered a wiring diagram showing circuits to provide for a failed battery on a passenger car. It was pointed out that the diagram was merely a suggestion and did not prevent railroads from operating the air conditioning system in the failed car if there were sufficient power available.

A previous report recommended 64 volts direct current for railway passenger cars but this year's report dropped the recommendation. After a lengthy discussion it was decided to determine the railroads preference by means of a questionnaire.

When asked about the committee's proposed diagram for a car ground detector, T. G. Isel (Pullman Co.) explained that 64 volt lamps were employed because they would show red on 32 volts and would not burn out during the brief test period on 110 volts. There followed a discussion of why a resistance of 15,000 ohms was used in a detector. This resistance would determine how high resistance a ground should be shown by the detector and it appeared that one must differentiate between an impossible high standard and a ground of such low resistance that the ground current flow might operate relays.



C. P. Trueax summarizes the work done by his committee.

## Power Supply

The report of the Committee on Power Supply was presented by C. P. Trueax, assistant electrical engineer, Illinois Central.

Advantages of 3-phase, 4-wire, 120/208 wiring systems for supplying power for engine terminal facilities is discussed in the report of the Committee on Power Supply. It is pointed out that it provides for 12.5 per cent more power capacity with a given amount of copper than can be obtained from a 3-phase, 3-wire system. It is also stated that 220-volt, 3-phase motors will operate satisfactorily from the 208 network voltage.

Among the various types of protective devices, the coil-less circuit breaker is given preference. Eleven reasons for its choice are given.

Two means for cooling diesel locomotives in the shops in the summer time are suggested and described. One of these consists of driving the No. 4 locomotive cooling plant from an outside source of 3-phase a.c. power. The other consists of a portable fan in a housing which can be lowered over one of the existing roof-mounted engine-cooling fans in the locomotive. The subject of portable electric generating equipment for roadway tools was explored, a questionnaire being sent to a number of railroads. From the 80 replies received, the committee has accumulated a considerable amount of data on railroad practice. It is collaborating with A.R.E.A. Committee No. 27 on maintenance of way work equipment. From its findings, the committee does not feel it would be practicable to recommend any specific current characteristics for the power supply. However, to insure safety to personnel handling the equipment, it is recommended that operating potentials should not be in excess of 230 volts. Also the frames of the generators and portable tools should be effectively grounded.

Yard standby power facilities, recently installed in the Jefferson Avenue Passenger Car Yards of the Wabash, at St. Louis, Mo., are described briefly in the report. It consists of the addition of duplex receptacles permitting the servicing of an average of 25 air-conditioned cars equipped with 25-kw. generators each day during the cooling season.

An error in the dimensions given previously for the A. A. R. plug for air conditioning standby receptacles is corrected, and drawings of the wayside plug and receptacle are shown. Drawings are also included for diesel lighting standby plugs and receptacles.

The 120/208-volt system was generally favored as a progressive step but it was warned that some 220-volt motors will not operate successfully on 208 volts, among them the standby motor on Pullmans. The committee pointed out that 208 volts was not recommended for air conditioning systems.



S. V. Smith responds to a suggestion during the discussion.

## Railway Electrification

The report of the Committee on Electrification was presented by S. V. Smith, assistant electrical engineer, Pennsylvania.

The Committee on Railway Electrification is instructed to develop annually a report on pertinent physical and operating statistics on railroad electrification systems in this country. In this connection, the report states that during the last two years, the technical and economic aspects of electrification system in this country have been investigated by the Battelle Memorial Institute. Significant results of these investigations have been compiled in a report titled, "The Possibilities of Expansion of Railroad Electrification in the United States," copies of which have been distributed through the Edison Electric Institute.

H. F. Brown, Consulting Engineer Westinghouse International, mentioned that two important new factors were causing a renewed interest in railway electrification: the application abroad of high voltage at commercial frequencies, which can reduce initial costs from 40 to 60 per cent, and the development in this country of the Ignitron locomotive and motor car. He recommended that more study be given to the relative life, first cost, and maintenance costs over the life of electric versus diesel-electric locomotives. If such items indicate a balance in favor of electrification, these factors possibly could show, with the reduced costs for the fixed property investments, applications in favor of further electrification. The impression some railway executives have that railway electrification is a dead issue might be changed by such studies.

## Safety

Work being done this year by the Committee on Safety includes revision of the Manual and a study of the principles of resuscitation, including pole top resuscitation.

## Electrolysis

Chairman H. P. Wright, assistant electrical engineer, Baltimore & Ohio, presented the report on electrolysis.

In the report of the Committee on Electrolysis, reference is made to the conversion of trolley car to trolley bus operation in which the trolley car rails are retained for current return. This situation frequently entails electrolysis problems since bonds buried under the pavement disintegrate and rails are sometimes cut when pipe lines are laid.

Notice is made of an improved electrolysis reverse current switch which has been developed by the Western Union Telegraph Company.

Methods of protecting structures against galvanic currents are listed as follows:

1. Cathodic protection.
2. Application of protective insulating coatings on exposed surfaces, usually during construction.
3. Drainage of moisture from the surrounding soil or locating the structures where moisture will be a minimum.
4. Using backfill material around the buried structure which



H. P. Wright warns of oil tanks installed without protection.

will minimize the magnitude of galvanic currents, such as the use of clean sand.

5. Using non-metallic material wherever practical instead of metallic material.

6. Increasing the external electrical resistance between the metallic structures and any other buried metallic material of different galvanic potential, if this is possible.

Cathodic protection, the report states, is usually supplied by means of an electric rectifier or some form of expendable anode.

Protective coatings on underground metallic structures are listed as not generally sufficient for reliability, but useful in reducing the amount of cathodic current required. Reference is made to the "Electrochemical Series" of metals for selecting expendable protective anodes. Actual installations of cathodic protection of steel water storage tanks are described. Results obtained have not been conclusive, but samples of metal with and without protection, placed in one of the tanks, showed that the protected specimen suffered no corrosion or pitting, while the unprotected specimen showed definite corrosion.

A method of protecting bottoms of steel oil storage tanks is described, as follows:

A circular concrete retaining wall, 8 in. thick, and 6 ft. greater in diameter than the tank, extending 3 ft. below grade and 12 in. above grade is installed. The area within the wall is filled with broken stone and sand at least 12 in. in depth and to a height of 7 in. below the top of the wall. A six-in. thick layer of clean sand thoroughly mixed with a low grade of fuel oil before installing is placed on top of the broken stone and sand fill. The bottom of the tank is shop painted before placing on the sand cushion. After the tank is completed, a mastic seal is placed around the tank to seal the area of exposed oil saturated sand. The mastic seal is at least two in. thick at the tank side tapering off to one in. at the concrete curb.

Cathodic protection of sheet piling retaining walls for a depressed track area is described. The installation employs graphite anodes with rectifiers for power supply. Data on results obtained will appear in a subsequent report.

Four bulletins covering the principles of galvanic and cathodic protection which have been prepared by the Correlating Committee on Cathodic Protection, sponsored by 11 associations including the Association of American Railroads, are included in the report. These bulletins call attention to the fact that corrosion of buried plants and equipment are costing American industry about a billion dollars a year, much of which is preventable.

Cathodic protection installed by one user may cause corrosion in a neighboring plant, and the report stresses the need for a good neighbor policy of cooperation in dealing with the problem.

Management information prepared by the Correlating Committee describes cathodic protection in non-technical terms. It indicates generally how this beneficial technique can be applied and the nature of interference problems to be solved cooperatively. It points out that where neighboring structures of two or more operators are subject to similar natural corrosion damage, joint cathodic protection systems can be designed and installed, and operated economically to the benefit and satisfaction of all concerned. Methods of procedure are suggested. The report is concluded with a selected Bibliography on cathodic protection.

Warning was given that many roads may be sorry for their practice of just sticking diesel fuel tanks in the ground with no protection against electrolysis. Experience with gasoline

stations built this way shows that they sometimes develop underground leaks and fires result. Those considering new water tanks should remember that it is economically sound to protect the interior, and they should study thoroughly all factors involved, including the type of water, which has a marked effect on the design of the system.



E. J. Feasey and his committee are doing the impossible.

## Wiring Diagrams

The report of the Committee on Wiring Diagrams for Rolling Stock was presented by E. J. Feasey, general supervisor, diesel equipment, Canadian National.

The work given to the committee constitutes a most difficult assignment. It attempts to coordinate the existing practices of many railroads and many manufacturers. The work will eventually result in clarifying wiring diagrams and greatly reducing the amount of drafting work required.

The committee's first assignment is to continue preparing recommendations for standardizing wiring diagrams and markings. A proposed specification for schematic diagrams is included in the report.

The second assignment is to progress completed work for standardizing diagrams and markings. Under this assignment, the committee recommends that material which has been approved and published in the Manual be sponsored by the A. A. R. for adoption by the American Standards Association as authorized by the Committee of Direction.

During the discussion, R. I. Fort (I.C.) said, "This is a good committee on which to serve." Battles within the committee are long and severe, but when agreements are finally reached, there is little left to discuss in open meeting. Mr. Fort's statement apparently did not cover all circumstances because a lengthy discussion followed concerning the relation of positive and negative wires in a diagram.

C. W. Martin (B. & O.) asked if everyone approved of having diesel locomotive wiring diagrams on a number of pages.

F. M. Nelson (U.P.) voiced approval of the pages as set up by the committee.

R. I. Fort said his department has been using the page idea for several years. This was accomplished by cutting up manufacturers' drawings and supplying the sections to the men in the shops.

F. M. Nelson said the men in the shops will do it themselves when the diagrams are not in page form.

H. M. Harrington (General Electric) asked what the chances are that the man on the locomotive may not have the piece that he wants. He also said the prints frequently are not as clear as they should be.

Mr. Fort said that he had no trouble with schematic diagrams which are not expensive. If the drawings, he said, are made on cloth in ink, the reproductions would be good. Mr. Martin explained that only the schematic diagram in page form is proposed at the same time.

Some wiring diagrams were criticized because a considerable number of wires which do not connect with each other must cross over each other in the diagram. It was generally agreed that these could be minimized by sufficient care in selecting the location of wires in the drafting room.

In conclusion, the Electrical Section extended thanks to the manufacturers for making necessary concessions and a rising vote of thanks was given to the committee for the splendid report it had compiled.



A thousand reprints are wanted of the specifications developed by C. R. Troop's committee.



D. F. Dunsmore can tell you what equipment you need in your shop.

## Wire, Cable and Insulating Materials

C. R. Troop (chairman), assistant engineer, New York Central, presented the report of Committee No. 10 on Wire, Cable and Insulating Materials.

The Committee on Wire, Cable and Insulating Materials was given six assignments as follows:

1. Revision of manual.
2. Prepare list of new A.S.A. electrical standards of interest to the Electrical Section.
3. Prepare and number specifications for apparatus and materials as may be assigned from time to time, including rubber-covered wires and cables.
4. Improved electrical insulation materials.
5. Wire and cable for use of locomotives and cars. (With recommendation that questionnaire be sent out on the matter of standard stranding of wire.)
6. Recommended practice for pressure-type terminals—fixed wiring on locomotives and cars.

All of the six assignments are reported on and the resulting specifications constitute the most voluminous report presented at the 1953 meeting.

T. G. Isel (Pullman Company) said he had been waiting a long time for the index of wire and cable specifications included in the report. He said it must have been a herculean task to put this information together and asked if the specifications might be supplied to Purchasing and Stores Departments.

R. I. Fort (I.C.) said Mr. Isel had posed a difficult problem since there are only about 150 extra copies of the report available. The question of making reprints of the specifications was discussed and referred back to the Committee of Direction for further consideration.

## Repair Shops

The report of the Committee on Repair Shops was presented by D. F. Dunsmore, electrical engineer, Chesapeake & Ohio, and several subcommittee chairmen.

In setting up the requirements for diesel shop facilities, the report of the Committee on Repair Shops stresses the importance of having a nucleus of capable individuals to support the work done in a diesel maintenance shop. Such men, the report states, after working with new locomotives for a few months could profitably be sent to manufacturers' training classes and be given opportunity to spend a week or two each year observing practices on other railroads. Having such men, much locomotive maintenance can be handled with a minimum of facilities. Further, as facilities can be justified and additional repair work undertaken, these men can become the nucleus around whom forces required for that work may be built and under whom men may be trained for enlarging the scope of repairs and starting an overhaul program as additional facilities for such work can be justified.

Without such personnel, the best shop facilities, whether small or large, cannot be operated efficiently or even satisfactorily.

Question has been raised by the smaller railroads as to what is the smallest size shop in which they can handle at least inspections, wheel and truck work, plus such repairs and servicing as a small railroad should expect to undertake.

The report lists specifications for such a shop, going into such detail as to almost discourage a prospective shop operator. Actually, all the important factors are given consideration and it should serve not only as a valuable guide to the prospective operator, but also as a check for anyone who is operating such a facility.

Of specific interest to the electrical maintenance man is a section of the report devoted to electrical repair shops. It outlines facilities required for the making of electrical repairs on railroads operating from 50 to 150 locomotive units.

The dilemma of the smaller railroad is well illustrated by replies to a questionnaire which was sent to five railroads having between 100 and 200 Diesel locomotive units in service. Of these five railroads only one is performing armature rewinding while the other four expect to return the motors or generators to the manufacturer or outside service shop for major repairs.

With the advent of the diesel-electric locomotive, control jumpers used between units have become an item of great importance since failure of one or more leads in one of these jumpers may cause locomotive failure. The importance of testing jumpers is stressed and recommended details of procedure are included in the report. The section on this subject, however, concludes by saying that test and research is still desirable on the entire test set-up and adds that it should be possible to soon have a standard test device which can be operated with a minimum of equipment and manufactured at a reasonable price by the railroad shops or outside manufacturer.

The shipping of traction motors to and from railway change-out points to railroad repair shops or to outside repair shops presents a hazard which needs close attention. The report states that damage to company material in transit may be even greater than that in actual service, and offers specific recommendations for shipping motors and generators.

All motors should be properly skidded and secured to skids either by banding or bolting. Skids should be of timbers large enough to support the motor and to insure that it will not tip over in transit.

For traction generators, banding is not sufficiently rigid to prevent movement. Ample blocking and clamps consisting of "U" bars must be provided.

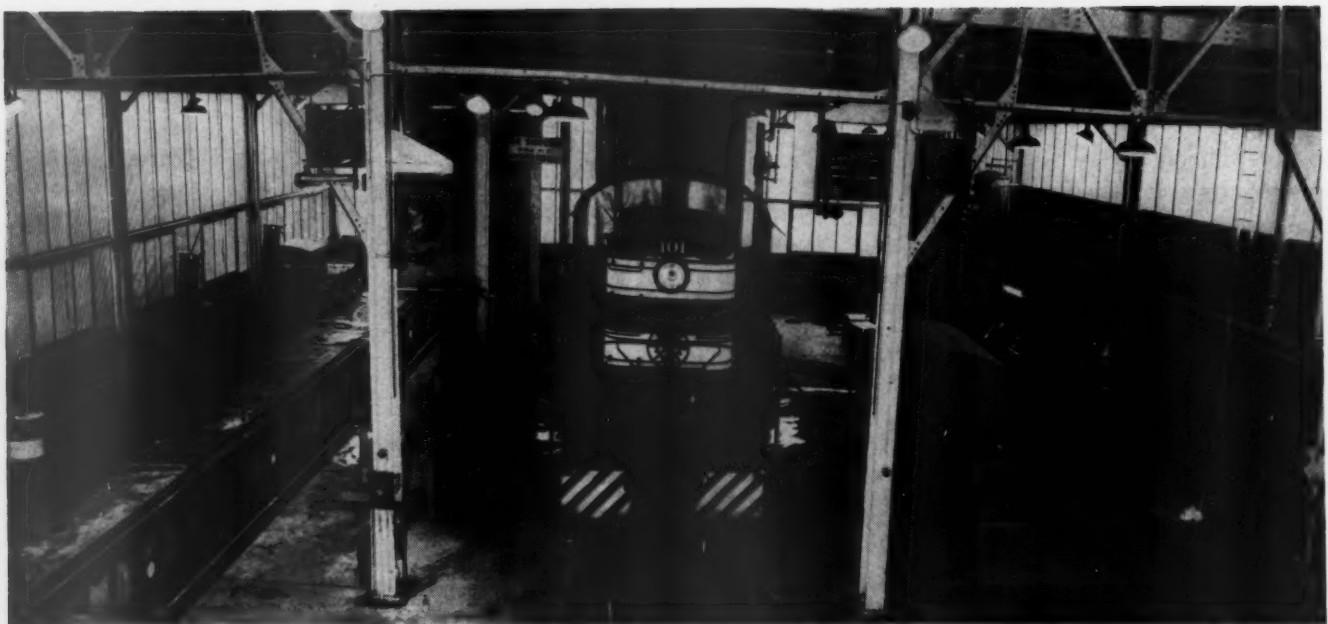
In addition to preventing movement of the entire generator, it is imperative that the armature be securely blocked and supported to prevent longitudinal movement in the bearing.

Auxiliary rotating equipment such as traction motor blowers, cooling fan motors, auxiliary generators should be skidded or boxed.

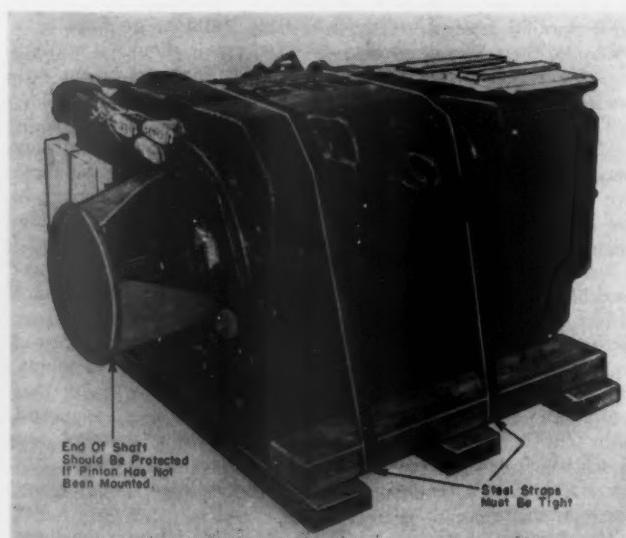
Whenever armatures are shipped they should be totally enclosed in boxes or other suitable containers to provide ample protection against damage. Protection must be afforded armature shaft to prevent damage.

Specially designed containers for relays, meters, gauges, cab signal equipment, injectors, fuel pumps, governors, tachometers, miscellaneous apparatus and delicate instruments are available and should be used for shipping these parts.

A failed part, the report states, is valuable even though covered with grime and dirt, or even bent, and should be accorded the

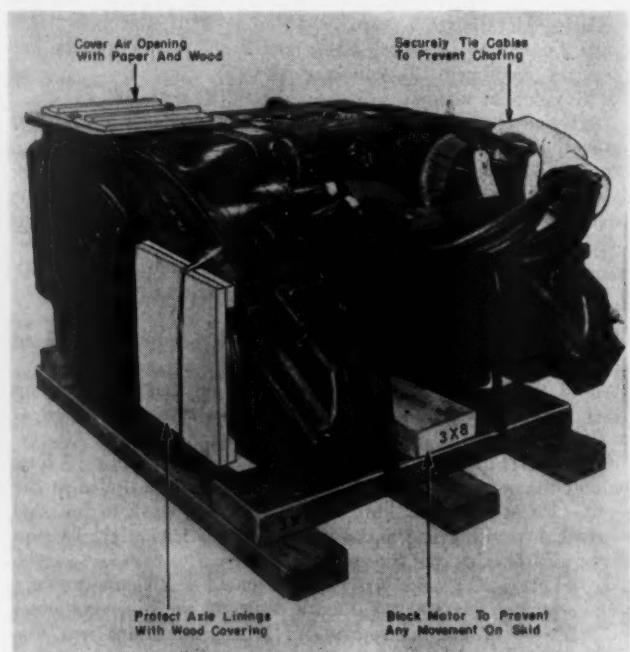


View of small diesel shop for maintenance of road switcher locomotives.



Above: Suspension side of motor when skidded for shipment.

Right: Axle side of motor when skidded for shipment.



same treatment as new material. The term scrap should not be applied to Diesel material until competent personnel have passed judgment on it.

Some railroads have initiated a campaign consisting of posters emphasizing the cost of diesel material as compared to items of every-day living. These posters are widely displayed in all shops. Inbound and outbound company-material cars should be inspected for proper lading.

It appears that much is to be desired in the way of an education program for personnel handling diesel material. It is a problem the railroads are going to be faced with continually and positive action must be initiated if they are to realize the potential savings available to them.

High-potential direct current testing of electrical equipment is being studied with much interest by the committee. As more information becomes available on this development, it will be included in future reports.

Cleaning electrical apparatus, the report states, is a question which needs more study and a single answer is difficult because cleaning requirements are different on various railroads.

The committee made an extensive survey of the cleaning meth-

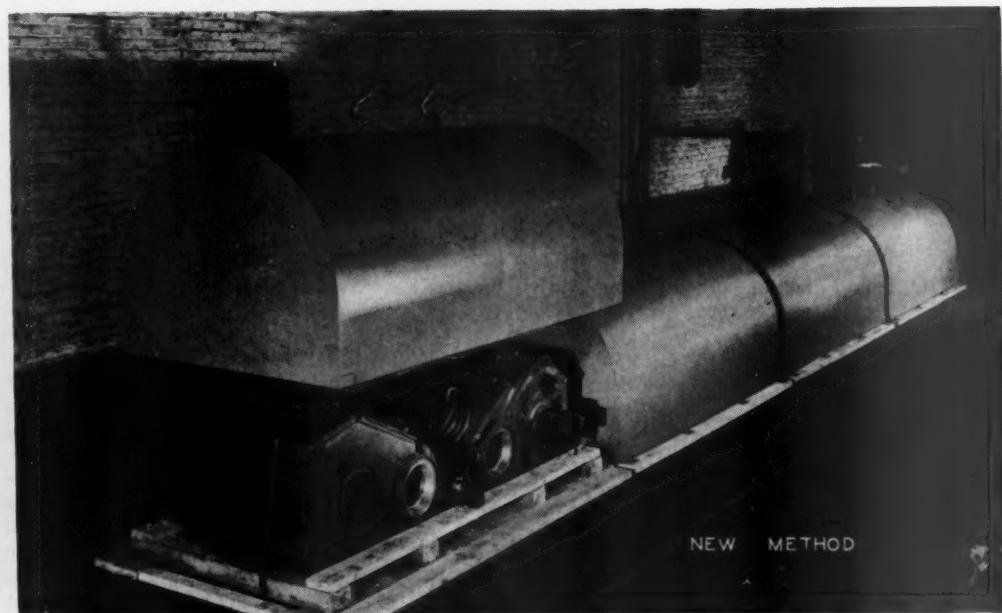
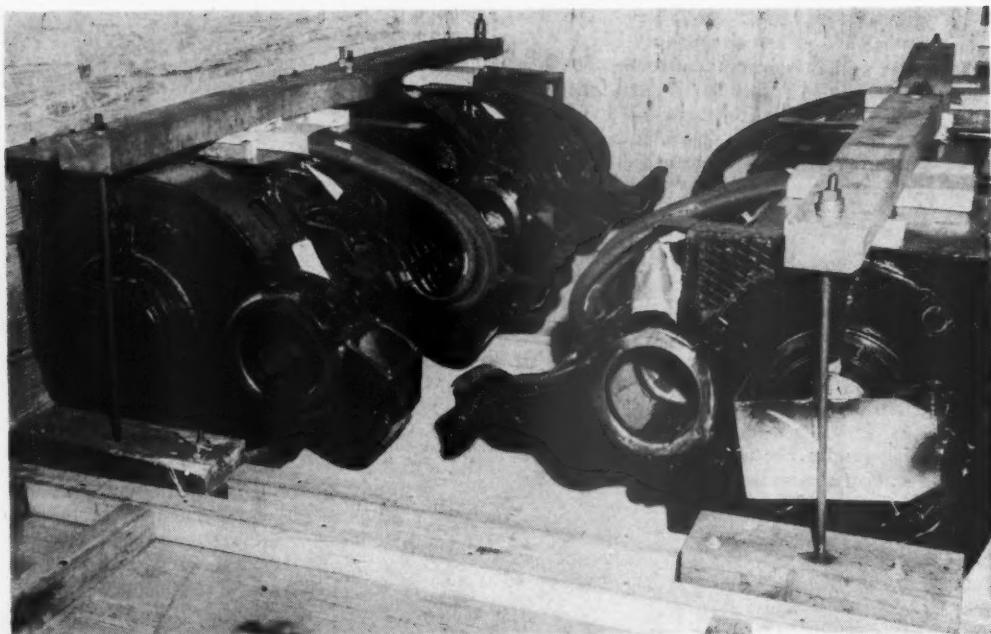
ods now being employed by the larger railroads and outside repair shops for cleaning electrical equipment. The purpose of this survey was to determine the various methods and materials being used as well as the advantages and disadvantages of each method. The committee feels that cleaning is one of the most important factors in maintenance and overhaul of electrical equipment and as such merits the use of a high grade of supervision and skilled labor.

Considerable discussion was given to the testing of diesel-electric locomotive control circuit jumpers. The railroads use a variety of means of testing them and there was no general agreement as to the best way of determining, respectively, continuity, current-carrying capacity, insulation strength, and whether or not resistance could show the condition of a wire since contact resistance at the respective terminals varies. There was also some difference of opinion concerning the desirability of a mechanical endurance test, if the cable is to be placed in service after such a test is made.

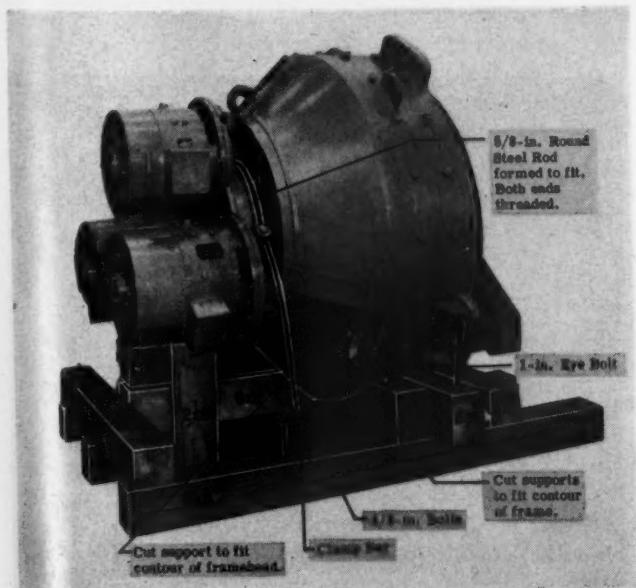
R. H. Herman (Southern) suggested that the committee continue its study of jumper testing methods.

H. G. Jungk (Westinghouse), when called upon, said that his

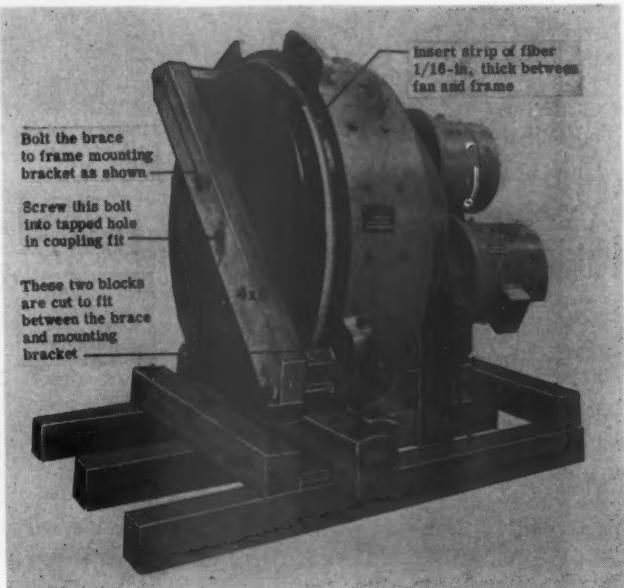
**Motor skids must be blocked to prevent their movement in the car.**



**By means of this method, motors may be shipped on flat cars.**



**Commutator end view of generator skidded for shipment.**



**Fan end view of generator skidded for shipment.**

company has looked into the matter of high voltage direct current testing. He said it is being used to test for faults without breaking down insulation and is being given further study.

H. E. Preston (I.C.) said there is much interest in this method of testing and that he feels it could be of great benefit.

G. Hargarten (DuPont) was asked about degreasers. He said railroads have a choice of using trichlorethylene or perchlorethylene. There are definite differences between these two chemicals and he said they should be used with a full knowledge of their capabilities. He said he and his associates would be pleased to answer any questions which might be put to them.

A. L. Kelly (M.P.) said the Missouri-Pacific is still using corn cob and corn meal cleaning. There is a need, he said, for a means of cleaning main generators in place. He expressed the opinion that a good method is not yet available.

F. T. Battey (Electro-Motive) said his company does not use degreasers. First, he said, there is a safety reason and he added that unless careful control is exercised damage can be done to insulation. Experience, he says, shows that core loss is greater on motors sent in to Electro-Motive by railroads which have degreasers than by those which do not. He said he could not offer quantitative information on this subject.



L. E. Grant tells how to use a metal spray effectively.

included for the application of sprayed metal. These include procedures for different metals and include the preparation of the base metal and the operation of the torch.

It is necessary to keep most coated welding electrodes dry, though it is possible to remove too much moisture from some types. Recommended practices for drying and storing electrodes are outlined in the report.

The convenience of magnetic ground clamps is described in the report, but spring loaded clamps which will bite through rust or a screw clamp are generally recommended for railroad work.

Any clamps, the report states, should be applied so that the welding current will not pass through bearings. Roller bearings are particularly susceptible to the passage of heavy electrical currents and even sleeve bearings may be damaged.

Concerning the welding on traction motor frames, the report of the Committee on Welding and Cutting reads as follows:

Repairs on traction motor frames by various methods of welding have proven practical, economical and necessary in the maintenance of diesel electric motive power.

As is the case in most repairs to diesel locomotive parts, it is necessary to work to close tolerance. This is not too much of a problem in weld repairs on motor frames due to the fact that in the majority of cases the part is machined or ground to finish size after welding, although reasonable precautions should be taken to keep heat distortion to a minimum. Some of the parts which are subject to wear and which may be restored by welding are spline fits, frame bore, axle bore, bearing housings, gear cases, gear case arms and motor support bearings.

With the exception of the motor support bearings which are bronze, the worn surfaces of the traction motor may be built up with AWS type E-60xx welding electrodes. In most cases small diameter electrodes are recommended to keep the heat to a minimum. To avoid local heat concentration, weld passes should be staggered throughout the area being built up. Each increment of weld should be peened with a blunt tool to control distortion. This will also serve to cool the part as well as clean the weld.



E. M. Hastings tells of agreements reached on wire crossings.

## Transmission Lines

The report of the Committee on Transmission Lines was presented by Committee Chairman E. M. Hastings, wire crossing engineer, Chesapeake & Ohio. He reported on the work being done on wire crossings by the several associations involved. An agreement submitted has been approved by the Rural Electrification Committee. He explained that this is a guide form of agreement only.

## Collaboration

S. R. Negley, electrical engineer, Reading, presented a report of the Committee on Collaboration. He said no general meeting has been held but that the committees involved have been active and the work done by it will be reported to the membership.

## Welding and Cutting

L. E. Grant, engineer of tests, Chicago, Milwaukee, St. Paul and Pacific, presented the report of Committee No. 6 on Welding and Cutting.

The report of the Committee on Welding and Cutting deals primarily with welding on traction motor frames, gear case arms, truck equalizers, the application of sprayed metal, and shop storage of electrodes. For traction motor frames, small diameter electrodes are recommended to keep heat to a minimum. It is also recommended that weld passes be staggered throughout the area being built up to avoid heat concentration. These procedures are followed to avoid warping and allow for machining to close tolerances.

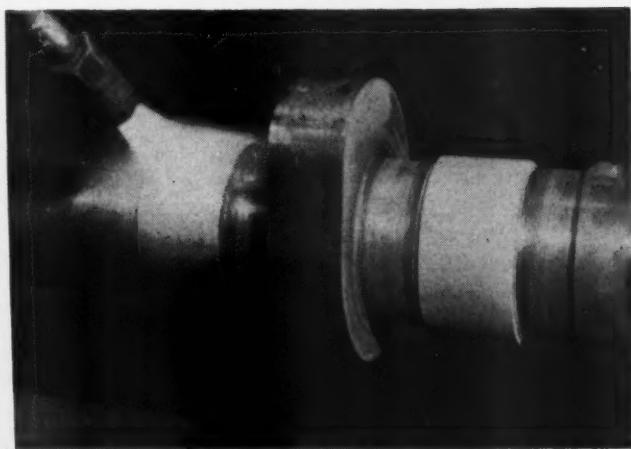
Procedures are outlined for welding of cracked gear case arms and of passenger car truck equalizers. Detailed instructions are



Traction motor armature shaft—sprayed.



Metallized traction motor end housing bearing seat.



Diesel cam shaft—bearing at the right has been sprayed; the one at the left is being preheated for spraying.



Diesel engine cylinder liner being prepared for metallizing corroded wall.

Motor support bearings wear down on the hub face and may be restored by building up with bronze either by electric arc, oxy-acetylene or inert arc process. To prevent the babbitt from melting out, the bearing may be immersed in water to as high a level as will still permit welding.

When practical, it is recommended that all work be positioned to permit welding to be done down-hand. All parts should be clean and free of grease, oil and other foreign matter before welding is performed.



G. L. Sealey tells of development in railroad lighting

### Illumination

G. L. Sealey, assistant engineer, Reading, presented the report of the Committee on Illumination.

Various types of new lighting sources are listed and described in the report of the Committee on Illumination. These include 40- and 100-watt rapid start fluorescent lamps, two additional 1,000-watt color-improved mercury lamps, and two 300-watt, PAR-56 spot and floodlamps. Concerning the four-watt ozone-producing lamps, the report states that experiments with this ozone source are under way on several railroads.

The recently developed method of dimming fluorescent lamps is mentioned and the report states that this can be done without change of color, whereas incandescent lamps become increasingly red when dimmed.

As an example of a modern installation of lighting in a steam  
(Continued on page 90)



Fig. 1—A general view of the diesel locomotive work area and the fixture mounting methods.



## R.S.M.A. Atlantic City Exhibit Attracts Crowd of Over 9,000

THE 1953 exhibit of the Railway Supply Manufacturers Association, held in the Convention Hall, and, as far as the track exhibits were concerned, at Bacharach boulevard and Ohio avenue, in Atlantic City, represented a total expenditure of over 20 million dollars, between 3 million dollars and 4 million dollars of which was represented by the cars and locomotives making up the track exhibit. At the Convention Hall the entire main floor and most of the basement exhibit space was taken up by the showings of railway and allied equipment represented by 197 companies.

The track exhibit, on four tracks, within an enclosure, was located on 4,200 ft. of track and included 9 diesel-electric locomotives, the Budd RDC-3 and RDC-4 rail diesel cars, the Westinghouse Ignitron electric locomotive, 4 passenger cars, 34 freight cars and the ACF-Talgo train.

It is not possible even to estimate the total number of products that were on exhibit in the Convention Hall

spaces but they must have been numbered in the thousands, ranging from tiny thermostats for controlling the temperature in passenger cars to complete car trucks, with accessories, and operating models of such things as freight car draft gears.

Those who attended the 1937 and 1947 Atlantic City exhibits could not help but be impressed by the complete change from steam to diesel power and the myriad of new devices that have come into being as a result of the introduction of this newer form of motive power. Those devices having to do with cars have been somewhat less spectacular in their development but the exhibit was definite proof that major progress has been made in this field even since the end of the war.

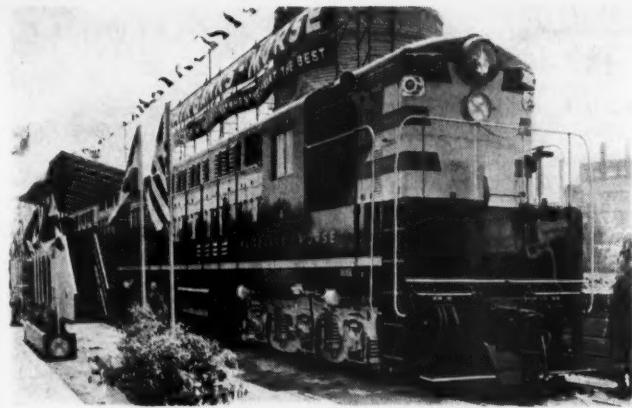
These two pages show briefly, in pictorial display, some of the things that the more than 9,000 visitors to the "Big Show" had an opportunity to look over during the six-day exhibit which closed at noon on Saturday, June 27.



The new 1,125-hp. General Motors locomotive, Model B, built for service in foreign countries.



One of the Budd RDC-4 rail diesel cars built for mail and express service on the New Haven.



Above: The 4,800-hp., two-unit, Fairbanks, Morse locomotive with 12-cylinder opposed-piston engines.

Below right: The north end of the track exhibit as seen from about the center of the exhibit; below left: The Baltimore & Ohio 50-ton hopper car built of Cor-Ten steel in 1934 which is still in service, and The Baldwin-Westinghouse 5½-ft. track gage locomotive being loaded for shipment to Argentina. The locomotive has a total weight, in working order, of 230,000 lb.

The panoramic pictures across the top of these two pages show practically the entire exhibit of the R.S.M.A. in the Convention Hall at Atlantic City. This picture was taken from the boardwalk end of the Hall immediately after the close of the opening ceremonies on Monday, June 22.

Below: The first "King Size" tank car of 19,200 United States gallon capacity built by A.C.F. for the Canadian Pacific.

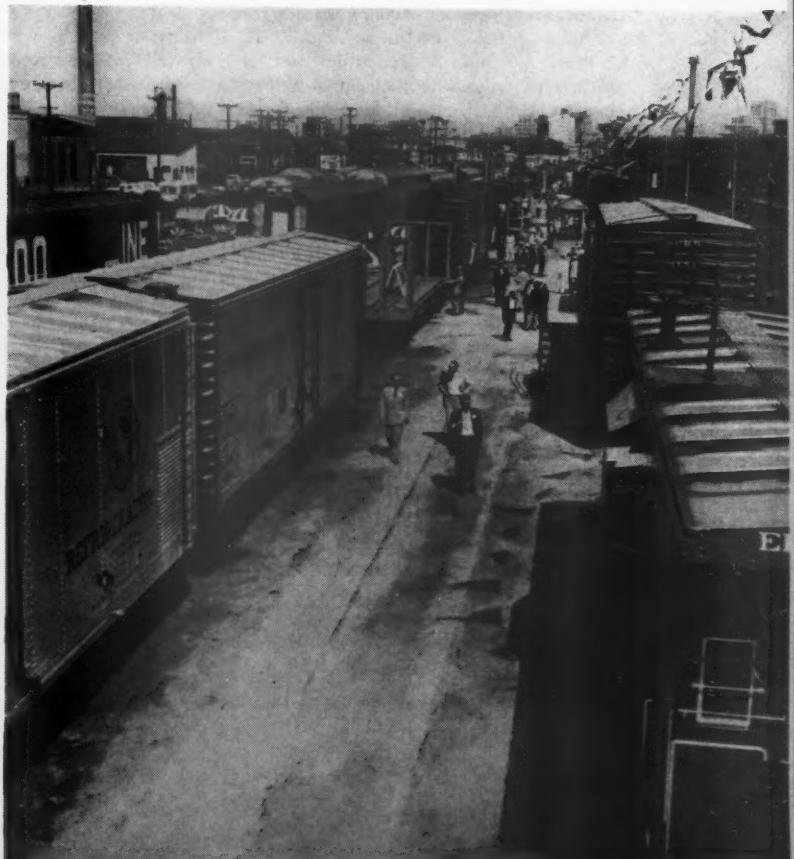
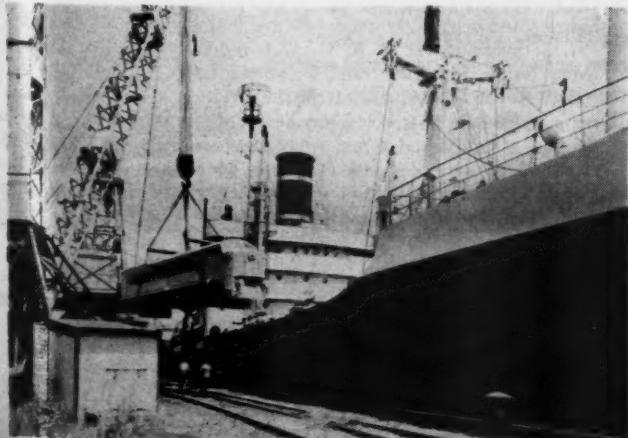
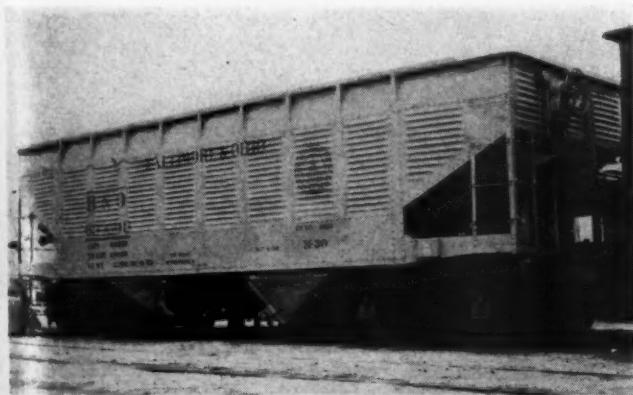
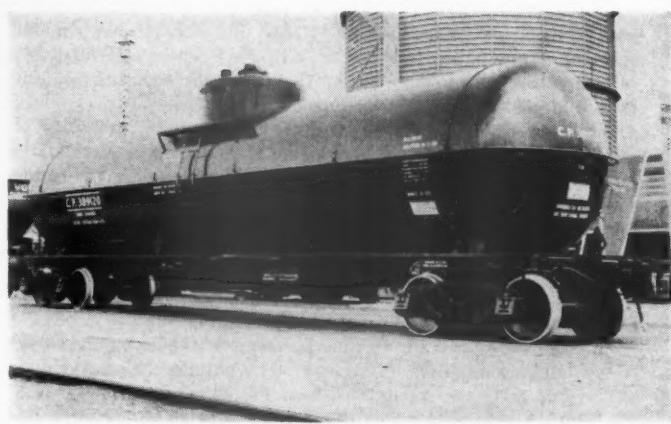




Fig. 2 (Left) — Improved lighting of small station platforms and adjacent parking areas

Fig. 3 (Below) — Lamps can be lowered on a trunnion for cleaning and servicing

locomotive repair shop converted for use as a diesel shop, description is given of lighting recently installed by the Baltimore & Ohio in its Glenwood Shops at Pittsburgh, Pa. Use is made of fluorescent lighting fixtures for the various specialized applications and intensity values to conform with recommended standards are obtained in the various areas.

The shop consists of a high center bay, and a medium bay on each side, together with storehouse and office. The high center bay is used for general erection, and the medium bay on one side for a production-line engine stripping repair and assembly section, while the medium bay on the other side contains machine shop and electrical repair sections.

While previous committee reports have covered examples of general shop lighting by various methods, this shop is particularly interesting by reason of the specialized lighting found in it. In the diesel locomotive repair section the side of cab is illuminated to a level of 30 footcandles, the running gear to over 50 footcandles, the underside to 30 footcandles and the top to 30 footcandles in accordance with the table of suggested footcandles recommended by the committee. All work is performed with ease without the use of extension cords or other portable lights.

The running gear is illuminated by continuous rows on each side of two lamp 40 watt, 48" fluorescent angle fixtures with heavy non-shatterable glass covers mounted near the edge of the lower work platform. A man working on the running gear stands between the lights and the locomotive, but due to the great amount of side illumination, casts no shadow on the running gear.

The underneath of the locomotive is illuminated by 200 watt recessed pit-lights 9' apart on each side of the pit, staggered alternately, so that there is a pit-light every 4½ feet. These are circuited so that half can be used at a time if desired.

The work platforms and sides of the locomotives are illuminated by nearly continuous rows of two lamp 40 watt industrial type fluorescent fixtures, and the top of the locomotive by 750 watt incandescent high bay fixtures.

Figure 1 shows a general view of the diesel locomotive work area and the fixture mounting methods.

Lamps recommended as standard for locomotive and passenger car lighting are listed in tables in the report.

An interesting development in the lighting of small station platforms and adjacent parking areas is shown in Figure 2. This installation is on the New Haven Railroad and involves the use of the 20,000 dumen type H400E1 form 109 mercury luminaire mounted at 30 feet height and with spacing varying from 100 to 125 feet. Lamps are arranged so that they can be lowered on a trunnion for cleaning and servicing as shown in Figure 3. Data is presented as information as it represents an unusual method of providing illumination at small stations where lighting of parking areas is also to be considered.

The report is concluded with recommended footcandle intensities for all types of railroad lighting.

L. F. Williams (S.P.) asked if the intensity of five footcandles proposed in the report for hump areas was a practical value.



H. H. Helmbright (General Electric) replied that while he could not name specific places, it is his understanding that there are a number of locations in which flood lamps are used where the lighting intensity is in excess of five footcandles.

J. J. Schmidt (D. & R. G. W.) reported that his railroad is using intensities of 3½ and 4 footcandles for hump lighting.

Mr. Helmbright spoke of the importance of reducing types of lamps. He said that costs can be reduced by increasing the production of individual types. A discussion followed which called attention to several types of lamps which are used very little, and the committee will give consideration to the possibility of dropping them from the specifications.

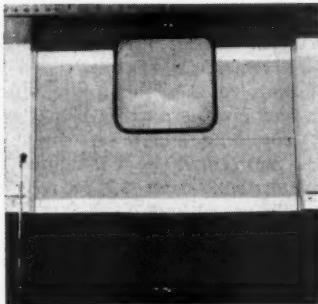
# MET-L-WOOD

METAL BONDED TO PLYWOOD

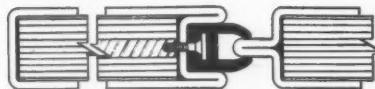
## DOORS

- ★ LIGHT...TOUGH...
- ★ DURABLE
- ★ NO THROUGH-BOLTS
- ★ NO WARPING
- ★ NO TWISTING
- ★ NO SWELLING

### BAGGAGE AND POSTAL CAR DOORS



Completely weatherproof Met-L-Wood doors effectively prevent internal rust and rot...and their tough, smooth surfaces stay new-looking for years. Stainless steel channels along bottom edges of sliding doors are rustproof...virtually wearproof. All-rubber window sash installed or removed in minutes...rattle-proof...water- and weatherproof. Available in full width and split types...sizes to meet all needs.

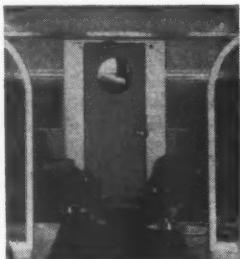


Exclusive Split Door Seal

Drawing above shows simple Met-L-Wood Split Door Seal which assures weather- and watertightness for years of continual use. Seal also provides effective cushion when closing split doors.

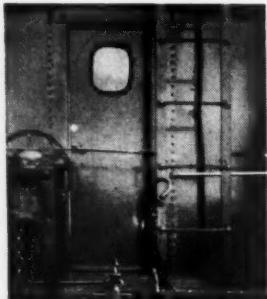
### PASSENGER CAR END, VESTIBULE, INTERIOR DOORS

Sound-deadening, insulating, vibration-damping Met-L-Wood doors for passenger cars add to service life, cut deadweight...Combine modern, clean-line beauty with great strength and durability. Furnished for manual or automatic operation, with or without hardware assembly. Tapping plates for hardware are built into doors...invisible additions to strength and trouble-free service life. Sizes and types to fit all requirements...exact dimensions insure quick assembly and perfect fit. Door thicknesses from  $\frac{1}{2}$ " up, as required.



### CABOOSE DOORS

Met-L-Wood caboose doors are built to last the life of the caboose—and to give trouble-free service the whole time. Weather-proof, warp-proof, rot-proof doors can be provided with or without stationary windows in all-rubber sash or with standard drop sash. Available with or without hardware. In all sizes to exactly meet specifications.



### DIESEL LOCOMOTIVE DOORS

Widely used by builders on new locomotives, Met-L-Wood doors guarantee trouble-free operation of end and interior doors on diesel road locomotives and cab doors for diesel switchers. Furnished to exact dimensions, with or without windows; either with hardware installed, or with tapping plates placed for hardware assembly on the job.



#### Write for this Bulletin

Met-L-Wood Bulletin 520 gives the complete, illustrated story on Met-L-Wood doors for railroad uses...shows construction details, describes standard and special types and sizes. Your copy sent free upon request—write for it today.



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CORPORATION



6755 W. 65th Street  
Chicago 38, Illinois

**MET-L-WOOD** • STRONG...LIGHT...Smooth Finish...Sound Deadening...Fire-Resistant...Insulating

# NEW DEVICES



## Pump Shaft Mechanical Seal

These "O" ring mechanical seals for rotating pumps are designed to provide leakless operation of shafts on centrifugal pumps handling chemicals, petroleum products, edible liquids, liquors and other liquids, whether mild, corrosive or extremely hazardous.

Made by The Garlock Packing Company, Palmyra, New York, they are furnished in Type 0, an unbalanced seal for pressure up to 200 lb. per sq. in. and in the Type OB, a balanced seal designed for pressures up to and over 1,000 lb. per sq. in. Both can be supplied with single or multiple spring and pin-drive or sleeve-drive construction.

The rings are available in Teflon, Buna-N, Neoprene or Silicone. Metal parts contacting the liquid can be furnished in any suitable metal.

## Paint Strippers

Two paint strippers, Nos. 56 and 57, designed respectively for tank-immersion stripping and brush-on stripping of a variety of alkaline resistant paints and lacquers have been developed by Oakite Products, Inc., New York 6.

The manufacturer reports that Composition No. 56 is a thin-bodied solvent, neutral in character, having a pH of 7. It is non-flammable and contains no phenols, cresols, acids or alkalies. Desinged for use at full strength and unheated, the parts to be stripped are immersed for varying periods of time depending on type of paint, number of coats, age, etc. Used as recommended, the formulation is said to be safe on steel, brass, copper, zinc, aluminum, magnesium and wood.

The other product, Composition No. 57 is a viscous solvent intended to replace combinations of non-viscous solvent detergents and thickeners when stripping finishes from vertical and inverted surfaces of equipment. It is also non-flammable and contains no phenols, cresols, acids or alkalies. It can be used full strength on

all metals. Paint is then hosed or scraped off.

When work stripped is to be repainted, a thorough rinsing to remove all stripping materials is recommended.

## Waterless Hand Cleaner

While designed for use where water is not convenient or readily available, the product is water soluble. It rinses thoroughly, leaving dirty hands clean with no oily residue.

Developed by Magnus Chemical Company, Inc., Garwood, N. J., the product removes grease, paint, tar, grime and inks. It is a white jell, containing Lanolin and has no odor or solvent or ammonia. Having no alkali, it is neutral in its reactions and will not irritate or dry out the skin.

When water is not available, it may be wiped off with a towel, leaving the hands without a tacky feeling.



## Battery Flushing Reduced by Catalyst

A development in railroad storage battery maintenance, consisting of a catalytic device which preserves water in batteries, prevents corrosion and worns of impending battery failure, is now made for automotive storage batteries and will soon be made available for diesel-electric locomotive and passenger car batteries by Industrial Research, Inc., Miami, Fla. A palladium catalyst is constructed into a special battery cap called a Hydrocap which converts a battery's escaping hydrogen and oxygen gases back into water. The cap being manufactured is designed for the standard railroad monoblock batteries in use for railway car lighting and air condition-

ing and for diesel-electric locomotives. The Hydrocap, which is in effect a miniature chemical plant, replaces the conventional caps on the railroad battery's cells. The manufacturer states it will return 95 per cent of the battery's escaping water.

In addition to keeping water in the battery at a safe level longer than has been possible before, the caps prevent corrosion by capturing the corrosive sulphuric acid fumes which commonly escape and return them as water back into the battery. This tends to retain proper specific gravity and protects battery cables, holders, wiring, electrical terminals, etc., from corrosion.

Hydrocaps normally operate warm to the touch. A dead cell will make the Hydrocap remain cold while added burden is thrown on the other cells, which will then also give warning by being unusually hot. Too high a rate of charge which might be caused by an improperly set regulator will cause all caps to be abnormally warm.

## Heat-Resistant Insulating Varnish

A high heat-resistant insulating varnish, resign for high-temperature operating conditions, has been announced by Irvington Varnish & Insulator Company, Irvington, N. J.

This varnish, called Irvington No. 180, has undergone extensive laboratory and preliminary field tests which indicate no adverse effects on numerous electrical applications when operated at elevated temperatures as high as 356 deg. F. (180 deg. C.). It has a clear color, good oil and moisture resistance, with a dry dielectric strength of 2,100 volts per mil.

## Low-Cost Zip-Lift Hoist

A Zip-Lift electric hoist with rope control is announced by the Harnischfeger Corporation, Milwaukee, Wis. The new hoist is actually a standard Zip-Lift designed to be operated with the P. & H. one-hand rope control.

The hoist can operate continuously during intermittent usage for a period 25 per cent longer than the rated time limit. The weight-overload safety factor is said to be five times the rated capacity.

As in all P. & H. hoists, wire rope hoisting is used to assure wider range of side pull and greater safety from hidden wear. Other features include double brakes, oil bath lubrication, fully-enclosed construction, and greased-packed motor bearing.

(Turn to page 94)



"I could see the corpsman kneeling over me. The blood plasma was running down through a tube into my arm and he said everything was going to be O.K. I was walking across an enemy mine field in Seoul when one exploded and a piece of shrapnel caught me in the leg."

"Got enough of that stuff?" I asked him, pointing to the blood. "I guess we never have enough," he said, "but you can thank *somebody* for this pint."

"How do you thank 'somebody' for blood? For saving your life? When I got back home, I discovered the answer at my local blood donor center. There's only one way to say thanks—by giving some of your own blood."

## "How do you thank 'somebody' for Blood?"

Yes, all kinds of people give blood—for all kinds of reasons. But whatever *your* reason for giving blood, this you can be sure of: Whether your blood

goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

### **Business Executives!**

#### **✓Check These Questions!**

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- Have you given your employees time off to make blood donations?
- Do you have a Blood Donor Honor Roll in your company?

Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Have you arranged to have a Bloodmobile make regular visits?

Has your management endorsed the local Blood Donor Program?

Have you informed employees of your company's plan of co-operation?

Was this information given through Plant Bulletin or House Magazine?

Has your company given any recognition to donors?

Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent*!

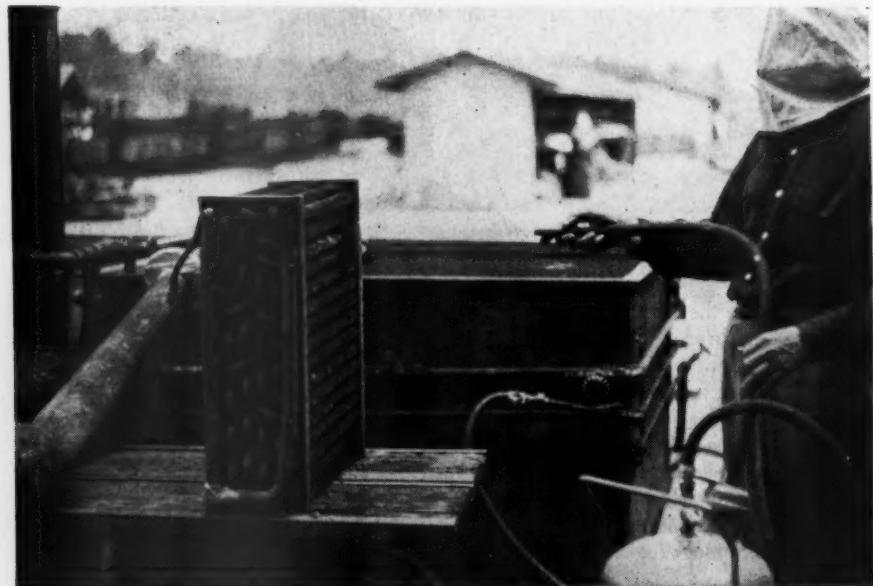


## **Give Blood Now—Call Your Red Cross Today!**

**National Blood Program**



ings. The new Zip-Lift comes in two models with lifting capacities of 500 and 1,000 lb. Hoisting rates are 25 and 13 ft. per min. Both models are available with 12 ft. and 18 ft. lift.



sample section of condenser tubing was subjected to the blast for four minutes at a distance of four or five inches. The wall thickness of the tube was .065 in. and micrometer measurements showed that the test had reduced the wall thickness .010 in. to .055 in. Since the nozzle is held much farther away for the cleaning operation and the time for cleaning any one spot on the condenser is only a

matter of seconds, it would appear that erosion because of such cleaning is negligible.

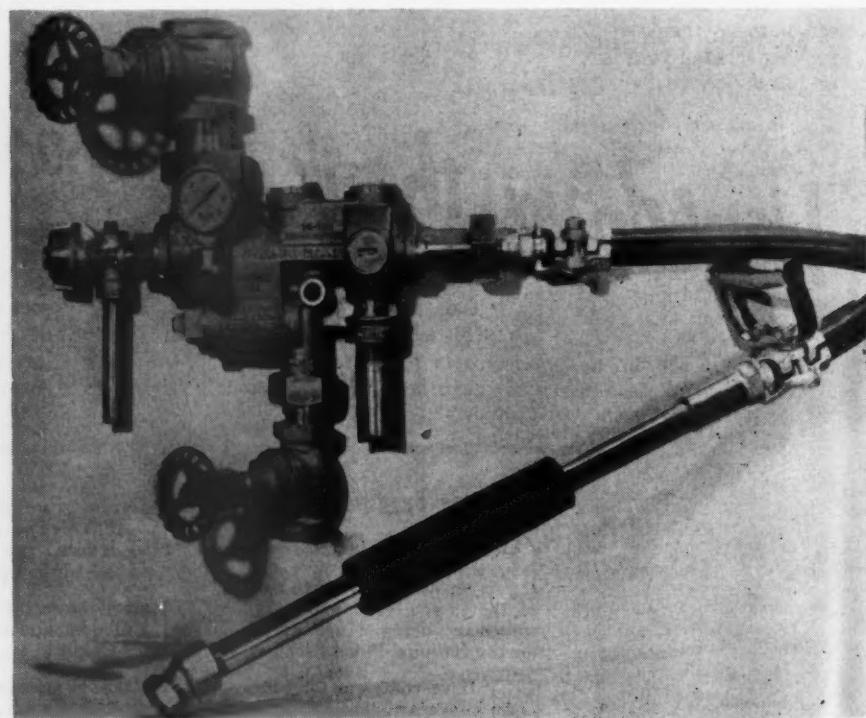
The machines, which are a new product, are designed for all kinds of sand cleaning and sand blasting. They are manufactured by Robert Anderson Machine Company, 8 Newington drive, Flatboro, Pa. They are made in three sizes to hold respectively 90, 150 and 220 lb. of sand.



## Sand Cleaning Of A.C. Condensers

A small sand blasting machine as a means of cleaning air conditioning condensers was demonstrated recently on a southern railroad. For this purpose the machine was connected to the shop air supply and was filled with a fine grade of sand. The machine is shown in one of the illustrations and the method of cleaning condensers in the other. The accumulation of dirt in the tubes wedged between the fins was removed easily.

Observers expressed concern about erosion of the tubes by the sand and a



## Booster Jet Cleaning Unit

This unit is designed to operate on cold water and low pressure steam of from 5 to 25 psi. Called the Booster Jet, the device provides a means of propelling a stream of high pressured hot water and detergent for heavy duty cleaning.

Manufactured by Sellers Injector Cor-

poration, Philadelphia 30, it converts low pressure inlet steam to a discharge pressure of 100 to 200 psi.

The high pressure stream is said to remove dirt, grease, and other matter from walls, floors and equipment. Length of the jet is manually controlled to extend as far as 30 ft. from the discharge nozzle. The unit requires no fuel or electricity.

(Turn to page 96)

## ACCURATE LUBRICATION and TROUBLE-FREE SERVICE

### NEW MAGNUS A-5 MECHANICAL LUBRICATOR



with 10 Important Features:

- New type ratchet drive
- Dependable pump
- Works only when engine is running
- Uses heavier grade oil
- No flooding
- No run-over on tire treads
- Lubricates up to 8 flanges
- Minimum moving parts
- Reduces flange wear
- No waste lubrication

Supplying a constant, metered flow of oil to locomotive wheel flanges, the new Magnus A-5 Mechanical Lubricator assures adequate lubrication without flooding or waste. It embodies new features combined with dependable design, proved in use on standard railroads.

The A-5 Lubricator, with only one pump, distributes oil to as many as eight points through the Magnus Fig. 399 Divider, holding moving parts and maintenance to a minimum. Oil is applied to the flange by means of the Magnus Fig. 379A Flange Lubricator.

Write for full details.

**MAGNUS BRASS MFG. CO.**  
Subsidiary of National Lead Co.  
525 READING ROAD, CINCINNATI 2, OHIO

WHEN CRITICAL  
MATERIAL IS SCARCE—

*Repair* POWER  
CABLES with

**A-MP** SOLDERLESS

**CONNECTORS**



HEAVY DUTY PNEU-  
MATIC TOOL #69015

Either "STUB" or  
conventional side  
position crimping  
with AMP's double-  
handled Pneumatic Tool. Inter-  
changeable jaws for wire  
sizes #6 to #1/0.

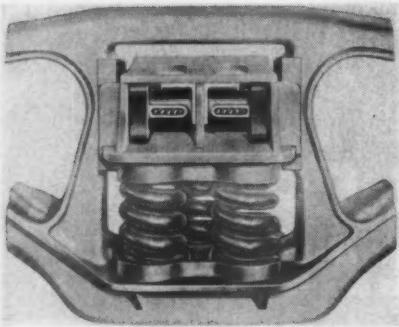


#### SOLISTRAND® BUTT CONNECTORS

Can be used on solid,  
stranded or irregular  
shaped wire. These pure  
copper connectors make  
strong, vibration-proof  
permanent splices #22  
to #4/0.

**AMP**  
AMP TRADE MARK REG. U.S. PAT. OFF.

**AIRCRAFT-MARINE PRODUCTS, INC.**  
2100 Paxton Street, Harrisburg 13, Pa.



## Holland Ride Stabilizer Unit

The Holland Company, Chicago has designed a bolster controlling device called the "Holland Ride Stabilizer Unit, Style RS-I," intended for use in existing AAR-approved freight car trucks which have not incorporated that feature. The mechanical arrangement of parts provides a mechanism which, when affixed within the bolster of the existing conventional truck, is intended to give riding qualities comparable to those of the new designs of modern high-speed trucks recently tested by the A.A.R.

The number of parts making up the new holland unit have been held to a minimum. Housings made of the same material as the bolster, after welding in position, become an integral part of the bolster. The friction blocks of hardened material are axially loaded by the control springs, and directly contact the hardened steel wear plates on the columns of the side frame. This method of axially loading the friction block prevents locking, jamming, or "bombarding" of the block on either the upward or downward movement of the bolster. Ample control-spring space allow the application of carefully-designed springs for maximum performance and service life.

Work required for installation of the new stabilizer unit has also been held to a minimum. After slotting the bolster-end faces, the housing is welded into position, and upon completion, the now modified bolster is annealed in accordance with AAR Rule 23.

A simple assembling jig is used for installing the friction blocks under control-spring pressure in the housing of the bolster. The insertion of a retainer key holds the block in position in the bolster until the bolster has been assembled in the truck side. Wear plates are affixed to the columns of the truck side. After the truck has been assembled, the retaining keys are removed, thus permitting the friction blocks to come into contact with the wear plates. Any bolster spring travel which the truck will accommodate can be used with the new stabilizer unit.

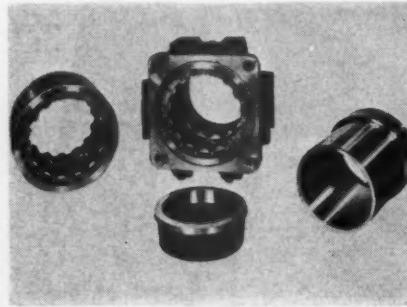
This latest design of Holland Ride Stabilizer Unit for application to freight car trucks not equipped with built-in bolster control is said to be comparable to the Holland Ride Stabilizer Unit, tested in 1950 under A.A.R. supervision and rated in final report No. 3800, dated June 30, 1951, as satisfactory at speeds up to 90 m.p.h.

## Anti-Corrosive Neoprene Paint

A system of anti-corrosion coating for all types of surfaces has been introduced by the Pennsylvania Salt Manufacturing Co., Philadelphia 7. The formulations are Neo-Coat and NeoPrime A for surfaces except concrete and NeoPrime B for concrete surfaces. According to Pennsalt, the system has resulted in savings up to 50% per sq. ft. in maintenance painting.

NeoCoat is a plastic, involving polymerization, in which the accelerator is included in the product, thus eliminating the necessity of mixing on the job. Polymerization takes place after the coating is applied.

The products are formulated to attain the proper thickness of 5 mils within three coats. They are said to be effective in covering welds, beads, seams, and edges where coatings most frequently fail.



## Roller Bearing Journal Box

A freight car roller bearing journal box of the pedestal type has been introduced. Called the Bower-Franklin Roller Bearing Journal Box, it is manufactured and sold by the Franklin Balmar Corporation, Baltimore 11, Md.

Initial design is of the 6 by 11 in. size, other units for all other sizes will be furnished. In addition, cartridge type roller bearing assemblies for application to existing side frames can also be furnished, if required.

The roller bearing is of the straight roller type. An important advantage of the straight roller bearing to railroads is the matter of interchange and inventory reduction. With these bearings, axles can be stocked with the inner races pressed-on, but there is no necessity for assembling boxes with the axles until they are applied to a truck. This will considerably reduce the total number of spare boxes required for protection.

The bearing assembly consists of two roller assemblies and a single inner and outer race. Free lateral of  $\frac{1}{2}$  in. is provided in this design. The inner race is interchangeable with the inner race incorporated in the design of a freight car roller bearing of another manufacturer.

The bearings are mounted in a housing made from either cast steel or from a drop forging. The outer races are completely

surrounded by this housing and are not exposed to the atmosphere.

The housing is symmetrical with respect to the horizontal centerline and thus can be turned 180 deg. in case wear occurs on the surface contacting the pedestal or on the upper portion of the races. These bearings are grease lubricated throughout by an alemite fitting, and a vent is provided to prevent build-up of pressure in the box.

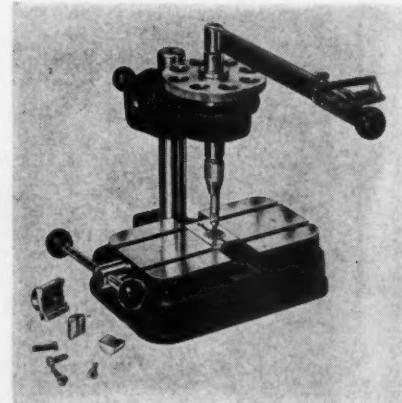
The boxes are shipped fully assembled so that it will require a minimum of time to apply them to the journal. Parts to be assembled with the journal are shipped separately.

## Stud Driver Guards

A line of special purpose guards for the Model 450 Stud Driver has been announced by Remington Arms Company, Inc., Bridgeport, Conn.

Designed for anchoring of special sections or fixtures to steel or concrete, the guards conform to the shape of the pre-fabricated sections, giving maximum coverage of work area plus easy tool and fixture positioning. Each of these guards may be rotated a full 360 deg.

These accessories include guards for fastening conduit clips, structural angle and channel, electrical switch, utility and outlet boxes, etc.



## Torque Tester

This device is said to provide a means for testing design, driving torque requirements, heat treatment or ultimate strength of screws and threaded fasteners. It can be used for proof-testing or making breakdown tests of parts or assemblies.

Made available by the P.A. Sturtevant Company, Addison, Ill., its adjustable spindle, set in instrument bearings, is held in alignment and permits engagement of the drive with the work. The spindle has a female drive square to accommodate a wide selection of torque wrenches within the capacity of the unit.

Two models are in production with capacities of 0-200 in. lb., and 0-150 ft. lb. Internally threaded collets, collet holders and drivers are available for all screws. (Turn to page 102)

# Install "SAFETY" Electro-Mechanical Air-Conditioning Equipment

with Outstanding Design Refinements for...

- ... greater cooling capacity
- ... less power demand
- ... reduced service costs

## The direct driven compressor unit...

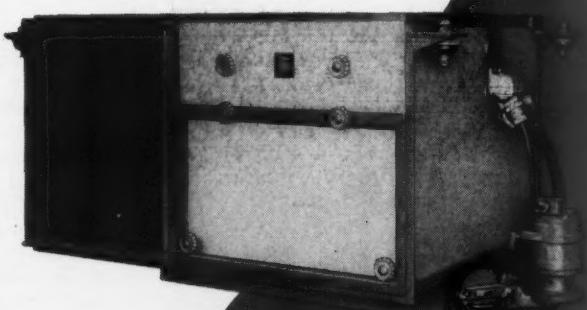
- featuring the modern Carrier unloading compressor for automatic capacity control
- an efficient "Safety" motor designed to meet all AAR electrical specifications
- simple flexible coupling to eliminate costly belt maintenance
- provides the best cooling system available for railroad passenger cars when installed with a...



"SAFETY" EVAPORATIVE CONDENSER

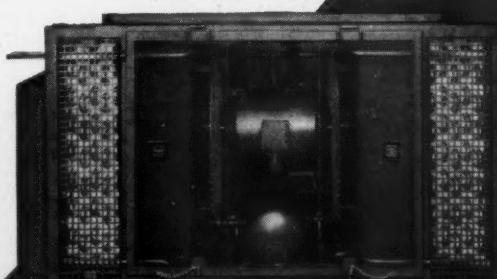
or

"SAFETY" AIR COOLED CONDENSER



### Evaporative condenser...

- maintains capacity... filtered air and large volume spray keep coil clean
- spray is non-clogging and sump can be flushed quickly
- all parts easily accessible



### Air-cooled condenser...

- large coil surface and air volume provide rated capacity without use of water sprays
- recommended for service where maximum operating conditions do not warrant Evaporative Condenser
- available with auxiliary water spray for unusually heavy cooling requirements.

THE **SAFETY** CAR HEATING AND LIGHTING COMPANY INC.

NEW YORK • CHICAGO • PHILADELPHIA • ST. LOUIS • SAN FRANCISCO • NEW HAVEN • MONTREAL

Safety Company Products include: Air-conditioning Equipment • Generators • Fans • Regulators • Blower Units  
Lighting Fixtures • Switchboards • Luggage Racks • Motor Alternators • Dynamotors • Motor Generators • Dual Voltage MG Sets

## New Devices

(Continued from page 96)



### Automatic Water Purification System

An arrangement to assure pure drinking water without unpleasant chlorine taste by automatic chlorination and subsequent filtering has just been introduced by the Tested Appliance Company, Chicago 8.

Known as the Everclor, the device is applicable to coaches, sleepers and diners. It feeds automatically a measured amount of chlorine solution into the pressure water storage tank each time the tank air pressure is released to permit refilling.

The Everclor and the associated filtering system operate on the principle of superchlorinating the water to eliminate impurities, then removing the chlorine by filtering to remove the unpleasant taste.

The automatic chlorinator is installed at the valve end of the water tank in the space between the tank and tank casing. The unit is piped so that it is filled with chlorine solution from the side of the car, with the fill cap located near the car water filling fixture.

The system is plastic lined from the chlorine fill cap, through the Everclor, thence to the top of the car water tank, and there are no moving parts to break or get out of order. An adjustment on the measuring cup regulates the amount of chlorine dosage. The unit is armor coated throughout to meet railroad requirements.

The Everclor has sufficient chlorine capacity to last a standard coach or sleeping car well over a month without refilling, and a diner for about two weeks.

Operation of the Everclor can be seen from the drawing. The fill pipe cap at (A) is removed and the unit filled with a 5 to 10 per cent chlorine solution, the

level of which is controlled by the fill tube (B). The measuring cup (C), vent tube (D), and the outlet tube (E) gradually fill up to the chlorine level through the cup fill hole (F). The chlorine fill cap is replaced and after the car tank has been filled through the water hose, air pressure is turned on, raising the whole car water system to its operating pressure. The air pressure in the tank is transmitted through small plastic tube (H), then through (E), (C), and (D), thus equalizing the pressure in the Everclor and the water tank. With pressures equalized, chlorine fills (E), (C), and (D), through (F), and is ready for the dosage operation. Equalizer hole (J) controls conditions should there be slow changes of pressure during car water usage.

Before filling the water tank, the air valve must be opened and the tank pressure released to atmosphere. The pressure in the Everclor vents itself through (D), (C), (E) and (H), back into the water tank, thereby forcing into the car tank a measured dosage of chlorine sufficient to superchlorinate the tank when full. The tank is then filled, air pressure turned on, and pressure between Everclor and tank equalized as before. This cycle is repeated at each water filling. The measuring cup (C) can be adjusted to provide the desired dosage to hold adequate residual of chlorine in the car water.



### Flame Hardening of Truck Center Castings

A method of substantially eliminating abrasion and burring, and increasing wearing life of locomotive tender truck center castings has been perfected by the Oxweld Railroad Service Company, Division of Union Carbide and Carbon Corporation, New York 17.

An Oxweld W-24-R blowpipe, equipped with a multi-flame head is used. Lightly

machined male castings are laid flat on a rotating mandrel for face hardening, and on the side for sidewall treatment. Inner walls of female castings are treated in the same manner. The castings are rotated at approximately 3½ ft. per min. under the flame and simultaneously water quenched.

The truck center castings consist of cast steel of approximately 0.25 carbon content. They average 129 Brinell before hardening, and 300 Brinell after treatment. Depth of flame-hardened area ranges from 1/8 to 1/4 in.

### Double End Tool Grinder

This unit, known as the Style 44-A, using 6 in. cup type wheels, can be used to sharpen tool materials such as sintered carbides, cast alloys and high speed steels. It is suitable for grinding carbide with diamond wheels.

Announced by the Ex-Cell-O Corporation, Detroit 32, it is capable of sharpening boring, turning and facing tools up to 5/8 in. square or equal cross-section area. Its U-shaped tool rest tables can be tilted to the exact angle required. Adjustments are shown on a scale which reads in degrees. A reversible motor on the device permits left- and right-hand tools on the same wheel. Cool cutting is assured by coolant supplied from direct motor-driven pump.



(Turn to page 117)

Here is the clear plastic box that got spectacular attention in Atlantic City as it proved beyond question the efficient action of the ROTH journal lubrication system.



# THANKS!

Your acceptance and praise for the three newest ROTH products for journal lubrication was most gratifying. Thanks for stopping by while you were at the Railroad Show. Having served the railroad industry since 1923, we knew your problem with inefficient methods of journal lubrication. We believe we have solved that problem!

For you who were unable to attend the show, we are listing the three items that operate as a unit to cut costs, prevent hot boxes and reduce maintenance labor. Yet they require no welding, no drilling or other costly installation expenses. You use your existing equipment!

If you have not already done so, be sure to send us your name so that you will be registered to receive latest engineering data and results of the AAR and other tests as soon as they become available.

### The ROTH LIDSEAL

AAR approved for interchange service



Keeps out dirt, dust, brine and rain . . . seals in oil. Easy to install. Exclusive breather permits ventilation.

### The ROTH LUBERATOR

Uses free oil . . . replaces obsolete waste packing. Fits any journal box . . . simply slips in place.



### The ROTH SEALOIL



Completely seals rear of box against dirt and moisture . . . keeps in oil. Adjusts to surface of dust guard well . . . reduces moisture condensation.

### MAKE YOUR OWN TEST!

The Roth lubricating combination will soon be available in quantities for testing purposes. If you desire to make your own verification of the marvelous job these items will do, please let us know. We will make sufficient units available to your road for a decisive and conclusive test of their performance in eliminating hot boxes.

\* PATENTS AND TRADEMARK REGISTRATION PENDING

**R**  
ROTHERM RUBBER COMPANY

1858 S. 54th AVE. • CHICAGO 50, ILL.

SERVING THE RAILROAD INDUSTRY SINCE 1923

# NEWS

## RSPA Chicago Meeting Discusses Freight Car Billing

THE meeting of the Railway System and Procedure Association Work Shop on A.A.R. billing at the Palmer House, Chicago, June 29 to 30, 1953, was presided over by discussion leader, T. E. Drury, assistant to the general auditor, Rock Island, and attended by 21 men representing nine railroads and two guests.

The object of the conference was to bring a small group of freight car repair, billing and accounting "experts" together for unhampered, unofficial discussion of what can be done to simplify methods, avoid duplication of work and thus reduce the cost of this work. The thought was that any ideas developed which seemed to hold promise could be tried by agreement between individual railroads. If the new methods work out well other roads might adopt the ideas.

The discussion of past and present practices in billing for freight-car repairs indicate possibilities for improvement providing the difficulties now in the way are attacked with sufficient ingenuity, open-mindedness and determination. One particularly "sore spot" was the multitudinous repetition of small repair parts which cost more to bill for than to buy new.

In a typical monthly bill for 10,009 freight-car repair items against a single

large road, for example, 4,462 were one-price items which occurred with great frequency and added much to the clerical cost with no adequate return. Cotter pins, at 26 cents each, were charged against 1,865 individual cars in this bill; brake shoes, at 1 dollar 51 cents each, 1,331 cars; brake shoe keys, at 29 cents each, 294 cars; air hose, at 3 dollars 56 cents each, 218 cars. Nineteen unidentified items were listed at 24 cents each, 133 at 16 cents each and 50 at 1 cent each. A check indicated that 3,888 of the items mentioned cost 1 dollar 51 each, or less. The conferees asked one question: Why is such detail necessary?

The average number and cost of monthly car repair bills were discussed, but no figures developed for general publication. The use of mechanized business machines to expedite billing for car repairs was considered sufficiently encouraging to warrant further and more general exploration. The use of short cuts such as arbitrary allowances for group repairs was favorably mentioned, but arbitrariness on a mileage basis were considered impracticable. The use of a monthly arbitrary based on prior-period actual repairs of owners' cars was also ruled out.

Three general recommendations were advanced by the Work Shop on A.A.R. billing, as follows:

(1) In lieu of the present method of

listing individual items by car number on monthly bills to railroads or private car companies, totals only, be shown for the major repetitive items such as: cotter pins, brake shoes, brake shoe keys, brake head wear plates and air hose.

(2) Use machine cards as initial information for processing in the billing department to accumulate repetitive items for pricing and billing at minimum cost.

(3) Propose that the A.A.R. Mechanical Division Price Committee examine Interchange Rules 101, 107 and 111 to see if labor and material allowances can be consolidated into a single charge instead of being separated as at present which complicates the billing and adds to the cost.

Many other suggestions were discussed at the Work Shop, but it was felt that these three ideas were enough to try as an initial step. One point strongly emphasized was the difficulty in training and keeping an adequate force of competent A.A.R. bill clerks who were said to require one, two or even three years experience under close supervision before acquiring sufficient knowledge to prepare bills accurately and make sure that individual roads collect legitimate charges for all repairs made to foreign freight cars. Training schools and modern instruction aids were recommended, but it was pointed out that even after completing prescribed courses, the trainee will frequently, under seniority rules, bid



Baltimore & Ohio museum, a historical transportation center created around an old passenger-car roundhouse, which was dedicated at Mt. Clare (Baltimore) on July 2 by Col. Roy G. White, president of the railroad, with ceremonies which included the reenactment, in costumes of the period, of the laying of the first stone of the B&O on July 4, 1828. The Transportation museum, as it has been named, is composed of three buildings. The oldest in the group is the original Mt. Clare station (center) which serves as the entrance. A former printing plant (right) contains the smaller exhibits, such

as paintings, railroad lanterns, models of bridges of all types erected from 1829 to 1947, and a comprehensive exhibit of rail sections recording the development of rail from the strap-iron-covered wood section. On the 22 radial tracks of the former passenger-car roundhouse are displayed historical pieces of rolling stock, including actual locomotives, freight cars and passenger cars that once ran on the railroad. The roundhouse also houses the Pangborn collection of full-size wooden replicas of historic locomotives. The museum is open to the public Tuesdays through Saturdays from 10 a.m. to 4 p.m.



## Got time for a postcard?

That's all it takes to get C & D's newest descriptive bulletin—to make the job of specifying and buying carlighting and air-conditioning batteries easier. It's chock-full of details and specifications. To get your copy, ask for Bulletin AC-546.



**BATTERIES, INC.**  
of Conshohocken, Pa.  
402 WASHINGTON STREET



**HARDENED  
and GROUND  
for LONGER wear**



Keep your equipment out of the shop and on the rails with Ex-Cell-O steel pins and bushings. They give from four to six times longer service than ordinary pins and bushings. The tough ductile core of Ex-Cell-O pins and bushings withstands shocks, vibration; their hard case and fine finish resist abrasive action.

52-29

Standard styles and sizes of Ex-Cell-O pins and bushings for steam, Diesel, and passenger car equipment are given in the new Ex-Cell-O Bulletin 32428. Write today for your copy.

RAILROAD DIVISION  
**EX-CELL-O CORPORATION**  
DETROIT 32, MICHIGAN



off a clerical job in some other department with slightly higher hourly rate, but requiring less specialized experience. The Work Shop was unable to suggest any solution for this problem except to keep training new men.

### Shields, B.L.E. Chief, Dies

JAMES P. SHIELDS, grand chief of the Brotherhood of Locomotive Engineers, died unexpectedly on June 29. Mr. Shields, who



J. P. Shields

was 64 years old, was elected head of the B. of L. E. on July 17, 1950, after retirement of the late Alvanley Johnston.

### SAL Building Diesel Shop at Hamlet

THE Seaboard Air Line has awarded a contract to the Fiske-Carter Construction Company, Spartanburg, S. C., for a diesel locomotive repair shop building and related structures which will be part of the facil-

### ORDERS AND INQUIRIES FOR NEW EQUIPMENT PLACED SINCE THE CLOSING OF THE JULY ISSUE

DIESEL-ELECTRIC LOCOMOTIVE ORDERS				
Road	No. of Units	Horse-Power	Service	Builder
Roscoe, Snyder & Pacific.....	1	800 <sup>1</sup>	Switching.....	Electro-Motive

FREIGHT-CAR ORDERS		
No. of cars	Type of car	Builder
Atchison, Topeka & Santa Fe.....	250	Pullman-Standard
Baltimore & Ohio.....	100 <sup>2</sup>	Company shops
	1 <sup>3</sup>	Company shops
	1 <sup>3</sup>	Company shops
Bangor & Aroostook.....	500 <sup>4</sup>	American Car & Fdry.
Birmingham Southern.....	15 <sup>4</sup>	Pullman-Standard
Canadian Pacific.....	65 <sup>5</sup>	American Car & Fdry.
Delaware & Hudson.....	25 <sup>6</sup>	Pullman-Standard
Norfolk & Western.....	25 <sup>7</sup>	Company shops
Savannah & Atlanta.....	100 <sup>8</sup>	Pullman-Standard
Southern.....	100	Baldwin-Lima-Hamilton

PASSENGER-CAR ORDERS			
Road	No. of cars	Type of car	Builder
Canadian Pacific.....	18 <sup>9</sup>	Dome-lounge-observation.	Budd Co.
	18 <sup>9</sup>	Dome-buffet-observation.	Budd Co.
	18 <sup>9</sup>	Dining.....	Budd Co.
	30 <sup>9</sup>	Day coaches.....	Budd Co.
	71 <sup>9</sup>	Sleeping.....	Budd Co.

<sup>1</sup> For delivery this month.

<sup>2</sup> Deliveries of this equipment, which the company has been authorized to build at DuBois, Pa. shops, are expected to be completed by the end of this year. The 70-ton flat cars are expected to cost approximately \$7,900 each, and the remaining cars at an approximate cost of \$27,000 each.

<sup>3</sup> Delivery expected in the fourth quarter of this year. Two hundred of these cars will be equipped with rubber cushion draft gears and 100 with the Hogan journal box. Estimated cost of the 500 cars, \$3,008,500.

<sup>4</sup> Estimated cost, \$112,500. Delivery expected during the fourth quarter of this year.

<sup>5</sup> To be of all-welded steel construction, with a capacity of 16,000 Imperial gallons each. The cars will carry fuel for the road's fleet of diesels.

<sup>6</sup> For delivery during the fourth quarter of this year.

<sup>7</sup> For delivery during the first quarter of 1954.

<sup>8</sup> Estimated cost, \$600,000. Delivery scheduled for the fourth quarter of this year.

<sup>9</sup> To be equipped with Budd disc brakes. The cars, the first of which are scheduled to be in service in the spring of 1954, will be air conditioned and will make up the first streamline trains of all-stainless-steel construction in Canada.

ties at the new \$8,000,000 hump classification yard the line is building at Hamlet, N. C. The total diesel shop installation at the yard will cost \$1,475,000.

The general contract for the new diesel shop covers mainly three principal buildings, with incidental service facilities. The diesel shop building itself will be approximately 200 ft. by 167 ft., of steel frame construction. The shop section proper will be 200 ft. by 120 ft., divided into two areas, one for running repairs and the other for heavy repairs. Also in this building

will be a storehouse area for heavy supplies and equipment, and another area in which will be located an electrical shop, air-brake shop, a small parts and filter cleaning room, and offices and rest rooms. Outside the main diesel shop will be two work tracks, both equipped with inspection pits 130 ft. long.

The power plant building will be 82 ft. by 32 ft. and will house two 350-hp. automatic oil-burning steam generators, air compressors, fire pump, and water-treating equipment for diesel locomotive use. The wash-and-locker building will be 100 ft. by 38 ft.

Auxiliary facilities will include pump houses, sanding installations, fueling platform, washing apron and storage tanks. There also will be on separate contract a 500,000-gal. fuel oil tank, and a 100,000-gal. water tank.

### Wright, A.R.C.I. President, Retires

Charles W. Wright, president of the American Railway Car Institute, retired on July 1. Gustav Metzman, chairman of the board of the Institute, has assumed the additional duties of the presidency.

The Institute is now located at 19 East 47th street, New York 17.

### Diesel Locomotives On an Electric Line

FOUR 1,500-hp. GP-7 general-purpose diesel locomotives have taken over the handling of through freight trains on the electrified main line of the Illinois Terminal.

The new Electro-Motive units are as-

### SUMMARY OF MONTHLY HOT BOX REPORTS

Foreign and system freight car mileage (total)	Cars set off between division terminals account hot boxes			Miles per hot box car set off between division terminals
	System	Foreign	total	
July, 1950.....	2,745,932,894			23,957 114,619
August, 1950.....	2,937,455,020	7,422	15,490	22,912 128,206
September, 1950.....	2,974,297,739	6,541	12,881	19,422 153,141
October, 1950.....	3,165,997,915	4,343	8,935	13,278 238,439
November, 1950.....	2,868,871,913	2,536	5,331	7,867 364,672
December, 1950.....	2,813,042,212	2,278	5,968	8,246 341,140
January, 1951.....	2,840,847,511	2,870	8,436	11,306 251,269
February, 1951.....	2,425,226,454	4,528	14,063	18,591 130,452
March, 1951.....	3,063,173,942	3,667	10,078	13,745 222,857
April, 1951.....	2,996,562,763	3,702	8,914	12,616 237,521
May, 1951.....	3,013,634,782	5,631	13,737	19,368 155,599
June, 1951.....	2,874,873,495	7,074	15,376	22,450 128,057
July, 1951.....	2,768,920,095	8,886	18,823	27,709 99,929
August, 1951.....	3,005,371,111	9,023	19,092	28,115 107,038
September, 1951.....	2,925,570,545	6,472	13,565	20,037 146,008
October, 1951.....	3,116,490,095	4,131	9,053	13,184 236,384
November, 1951.....	2,939,503,144	2,022	4,405	6,427 457,368
December, 1951.....	2,752,316,133	2,130	5,398	7,528 365,611
January, 1952.....	2,824,298,630	3,208	7,197	10,405 271,437
February, 1952.....	2,809,162,671	2,723	6,473	9,196 305,477
March, 1952.....	2,943,812,727	2,594	5,877	8,471 347,517
April, 1952.....	2,766,313,714	3,826	7,759	11,585 238,784
May, 1952.....	2,918,508,445	6,020	10,938	16,958 172,102
June, 1952.....	2,672,512,889	8,466	14,495	22,961 116,394
July, 1952.....	2,575,298,912	10,566	15,833	26,399 97,553
August, 1952.....	2,924,917,122	11,658	17,535	29,193 100,192
September, 1952.....	2,931,129,734	7,536	13,608	21,144 138,627
October, 1952.....	3,093,990,289	4,058	8,053	12,111 255,469
November, 1952.....	2,984,101,808	2,198	4,501	6,699 445,455
December, 1952.....	2,869,928,617	1,742	3,632	5,374 534,040
January, 1953.....	2,828,906,282	2,219	4,123	6,342 446,059
February, 1953.....	2,625,563,462	2,111	4,059	6,170 425,537
March, 1953.....	2,994,227,804	2,692	6,077	8,769 331,192
April, 1953.....	2,850,752,648	3,383	6,435	9,818 290,359

signed to runs formerly handled by 650-volt d.c. electric locomotives of the B+B+B+B type, which, because of the capacity of the overhead power transmission system, were limited to handling trains of a maximum of 1,750 tons. The new diesel units are enabling the IT to handle trains of 4,000 tons while materially shortening transit time over the line.

The through trains are operated from McKinley yard (in the St. Louis metropolitan area at Madison, Ill.) via Edwardsville to East Peoria—about 165 miles. In the past, trains were operated via diesel switching power to Edwardsville where, with a change of crews, changeover was made to straight electric power. When the locomotives were ordered several months ago, the company effected new agreements which allow crews to make the run straight through with the larger diesel units. Electric power will continue to be used for passenger trains and for such local and extra freight service as conditions require.

### Sillcox Nominated 1954 A.S.M.E. President

LEWIS K. Sillcox, vice-chairman of the board, New York Air Brake Company, has been nominated president of the American Society of Mechanical Engineers for 1954.

### Miscellaneous Publications

**HYDRAULIC JET CLEANER.**—Sellers Injector Corporation, 1600 Hamilton street, Philadelphia 30. Eight-page Bulletin No. 424 describes operation and performance of Hi-Pressure jet, booster jet, Chemo jet, and 6,000 GPH jet type cleaners which operate on ordinary plant steam and cold water.



**"AWARD OF HONOR"**—the highest award given by the National Safety Council—was presented to the mechanical department of the Chicago & North Western on June 17 for achieving the lowest casualty rate in 1952 of any large railroad mechanical department in the country. The award was presented to J. E. Goodwin (center), C&NW vice-president—operations, and W. H. Roberts (right), superintendent of safety, by Ned H. Dearborn (left), president of the N.S.C. The C&NW's mechanical department won the award with a record of no fatalities and a casualty rate of 1.22 per million man-hours worked in 1952. This is 68 per cent lower than the average casualty rate on all railroads during the previous three years.

### SELECTED MOTIVE POWER AND CAR PERFORMANCE STATISTICS

FREIGHT SERVICE (DATA FROM I.C.C. M-211 AND M-240)

Item No.		Month of March		3 months ended with March	
		1953	1952	1953	1952
3	Road locomotive miles (000) (M-211):				
3-05	Total, steam.....	12,553	18,865	37,962	58,728
3-06	Total, Diesel-electric.....	31,266	27,221	89,513	78,158
3-07	Total, electric.....	793	826	2,215	2,399
3-04	Total, locomotive-miles.....	44,677	46,923	129,869	139,305
4	Car-miles (000,000) (M-211):				
4-03	Loaded, total.....	1,710	1,718	4,870	5,006
4-06	Empty, total.....	895	902	2,623	2,681
6	Gross ton-miles-cars, contents and cabooses (000,000) (M-211):				
6-01	Total in coal-burning steam locomotive trains.....	21,833	33,635	66,127	105,902
6-02	Total in oil-burning steam locomotive trains.....	5,978	8,544	17,199	25,347
6-03	Total in Diesel-electric locomotive trains.....	87,758	76,036	248,656	215,998
6-04	Total in electric locomotive trains.....	2,213	2,329	6,162	6,646
6-06	Total in all trains.....	118,022	120,591	338,768	353,990
10	Averages per train-mile (excluding light trains) (M-211):				
10-01	Locomotive-miles (principal and helper).....	1,03	1.04	1.03	1.04
10-02	Loaded freight car-miles.....	41.50	40.20	40.70	39.60
10-03	Empty freight car-miles.....	21.70	21.10	21.90	21.20
10-04	Total freight car-miles (excluding cabooses).....	63.20	61.30	62.60	60.80
10-05	Gross ton-miles (excluding locomotive and tender).....	2,862	2,823	2,829	2,798
10-06	Net ton-miles.....	1,291	1,310	1,275	1,303
12	Net ton-miles per loaded car-mile (M-211).....	31.10	32.60	31.30	32.90
13	Car-mile ratios (M-211):				
13-03	Per cent loaded of total freight car-miles.....	65.60	65.60	65.00	65.10
14	Averages per train hour (M-211):				
14-01	Train miles.....	18.40	17.80	18.30	17.40
14-02	Gross ton-miles (excluding locomotive and tender).....	52,204	49,594	51,316	48,130
14	Car-miles per freight car day (M-240):				
14-01	Serviceable.....	45.10	45.50	44.70	45.40
14-02	All.....	43.00	43.30	42.60	43.30
15	Average net ton-miles per freight car-day (M-240).....	879	926	868	928
17	Per cent of home cars of total freight cars on the line (M-240).....	47.30	42.50	47.30	41.30

PASSENGER SERVICE (DATA FROM I.C.C. M-213)

3	Road motive-power miles (000):				
3-05	Steam.....	4,647	7,591	14,522	23,803
3-06	Diesel-electric.....	20,428	18,367	58,962	53,662
3-07	Electric.....	1,606	1,675	4,724	4,973
3-04	Total.....	26,681	27,637	78,208	82,446
4	Passenger-train car-miles (000):				
4-08	Total in all locomotive-propelled trains.....	267,553	273,270	786,310	814,977
4-09	Total in coal-burning steam locomotive trains.....	27,283	39,589	81,965	126,486
4-10	Total in oil-burning steam locomotive trains.....	13,544	25,995	45,943	77,833
4-11	Total in Diesel-electric locomotive trains.....	208,767	188,743	605,366	555,235
12	Total car-miles per train-miles.....	9.71	9.72	9.76	9.72

YARD SERVICE (DATA FROM I.C.C. M-215)

1	Freight yard switching locomotive-hours (000):				
1-01	Steam, coal-burning.....	601	912	1,809	2,871
1-02	Steam, oil-burning.....	117	174	346	514
1-03	Diesel-electric <sup>1</sup> .....	3,479	3,231	10,036	9,514
1-06	Total.....	4,219	4,340	12,259	12,970
2	Passenger yard switching hours (000):				
2-01	Steam, coal-burning.....	22	33	67	104
2-02	Steam, oil-burning.....	6	12	18	36
2-03	Diesel-electric <sup>1</sup> .....	265	258	774	767
2-06	Total.....	325	337	956	1,008
3	Hours per yard locomotive-day:				
3-01	Steam.....	6.30	7.00	6.40	7.40
3-02	Diesel-electric.....	16.40	16.80	16.30	16.90
3-05	Serviceable.....	14.70	14.40	14.70	14.60
3-06	All locomotives (serviceable, unserviceable and stored).....	12.90	12.50	12.80	12.70
4	Yard and train-switching locomotive-miles per 100 loaded freight car-miles.....	1.70	1.74	1.73	1.79
5	Yard and train-switching locomotive-miles per 100 passenger train car-miles (with locomotives).....	0.75	0.76	0.75	0.77

<sup>1</sup>Excludes B and trailing A units.

## SUPPLY TRADE NOTES

**AMERICAN LOCOMOTIVE COMPANY**—R. Tom Sawyer, manager of research, has been transferred from New York to the Schenectady, N.Y., plant.

**DEVILBISS COMPANY**—“A New Method for Painting” is the title of a full-color sound motion picture film produced by DeVilbiss on its traveling spray booth for spray finishing railroad cars, locomotives and buses. Scenes were taken at the Calumet shops of the Pullman Company in Chicago, and several are devoted to ventilation in the booth and the capturing of overspray by the water wash section of the unit, with emphasis on the booth's fire-safety equipment. The film has a running time of 11 min. and can be obtained

for showing to interested groups or individuals by writing to the advertising department of the company, 300 Phillips avenue, Toledo 1.

The metal working division of the DeVilbiss Company at Toledo is being expanded to provide addition space for manufacturing, storing and shipping spray booths. The addition will be of steel-frame and masonry construction.

**QUAKER RUBBER CORPORATION**—A new, stock carrying branch warehouse and sales office has been established by the Quaker Rubber Corporation, division of the H. K. Porter Company, at 2840 North Claiborne street, New Orleans. The new branch is under the supervision of Morgan Kather.

**WESTINGHOUSE AIR BRAKE COMPANY.**—*S. L. Williams*, eastern manager of the Air Brake division at New York, has been appointed assistant to vice-president and general manager at Wilmerding, Pa. Mr.



**S. L. Williams**

Williams will act as coordinator between engineering and sales departments. *R. M. Beswick* has been appointed southeastern district manager of the Air Brake division



**R. M. Beswick**

at Washington, D.C. Mr. Beswick, who has been assistant manager since August 1951, succeeds *V. B. Emrick*, retired.

**PYLE-NATIONAL COMPANY.**—Pyle-National has acquired all tools, dies, molds, machinery and equipment of the *M. B. Austin Company*, Northbrook, Ill., necessary to make a complete line of electric service entrance fittings.

**UNITED STATES RUBBER COMPANY.**—*Warren A. Tipton*, sales manager of the mechanical goods division, has been appointed general sales manager at New York.

**NEW YORK AIR BRAKE COMPANY.**—*Lowell R. Burch* has resigned as chairman of the board, but will continue as chairman of the executive committee and as a director. *Dr. Lewis K. Sillcox*, vice-chairman of the board, has been elected honorary vice-chairman, and in addition will continue as a director. *Charles T. Zaoral*, vice-president in charge of operations, and a director, has been elected a member of the executive committee.

**WAUGH EQUIPMENT COMPANY.**—Waugh Equipment has acquired all manufacturing and sales rights to Hulson "Plypak" journal box waste containers, and to Hulson and Duryea cushion underframes, from its wholly owned subsidiary, the *Hulson Company*. Hulson continues to sell and control manufacture of the Hulson type friction draft gear and the Tuyere locomotive and industrial grate. *J. W. Hulson* continues as president of the Hulson Company, and has been elected vice-president in charge of sales, Waugh Equipment, with headquarters in Chicago. *A. M. Bixby* and *R. C. Munro* continue as vice-presidents, Waugh Equipment, in charge of eastern and western sales, respectively. *H. N. Gardner*, *Robert Watson* and *W. K. Durbon* are vice-presidents of Waugh Equipment. The combined Chicago offices of the two companies are located at 310 South Michigan avenue.

**SUPERHEATER COMPANY.**—*S. L. Brownlee*, manager of sales, Western district, of the Superheater Company, Division of Combustion Engineering, Inc., has been appointed manager of sales for the entire division.

**UNITED STATES STEEL CORPORATION.**—*Gladstone C. Hill*, assistant to manager of sales of the United States Steel Corporation at Chicago, has been named assistant manager of sales at Indianapolis.

**BARBER-COLMAN COMPANY.**—Factory branch offices of the Automatic Control and Uni-Flow divisions of Barber-Colman have been opened at 218 Harrison street, Syracuse, N.Y.—*K. C. Watson*, manager; and at 1143 Mary street, Jacksonville, Fla.—*D. W. Minick*, manager.

**BONNEY FORCE & TOOL WORKS.**—*Roger O. Bay* has been appointed sales manager of the Tool Division of Bonney Forge at Allentown, Pa. Mr. Bay was formerly sales manager of the automotive division of the Cleveland Pneumatic Tool Company.

**AMERICAN WHEELABRATOR & EQUIPMENT CORP.**—*Robert L. Orth* has been appointed field sales manager after 14 years as district manager in the Detroit sales office. *Julius E. Skene* has been advanced to manager of customer service, and *Philip R. Jordan* has been named chief sales engineer. *Gordon R. Bryant* has been appointed district manager of the Detroit office; *John W. Swantz*, formerly at Chicago, district sales engineer at Detroit, and *Erwin C. Shepard*, service engineer. *F. H. Toman* replaces Mr. Swantz as district sales engineer at Chicago, and *J. Douglas Lamb* succeeds Mr. Toman as district service engineer at Toronto. *Wilfred G. Carrie* has been appointed district manager of the Seattle office. He was formerly a home office project engineer, Dust & Fume Control Division. *George C. Tolton*, former Seattle district manager, has been appointed district manager of the Greensboro, N.C., branch.

**OWENS-ILLINOIS GLASS COMPANY.**—Construction has started on a new technical center at Toledo which will consolidate the company's general research program with the engineering activities of its various divisions.

**KOPPERS COMPANY.**—*Fred A. Robbins* has been appointed chief engineer of the Piston Ring Department, in charge of all engineering activities for American Ham-



**F. A. Robbins**

mered industrial piston rings. Mr. Robbins served as senior project engineer for the Electro-Motive Division, General Motors Corporation, at LaGrange, Ill., from 1942 to 1952.

**PULLMAN COMPANY.**—*Harry B. Reed*, chief maintenance officer at Chicago, has been appointed chief mechanical officer, with jurisdiction over Pullman engineering, testing, repair shop and maintenance opera-



**Harry B. Reed**

tions. *B. N. Lewis*, supervisor personnel administration, has been named assistant chief mechanical officer, and *L. F. Munson*, mechanical goods division, has been appointed general superintendent of shops.

**FARR COMPANY.**—The *Air Filter Sales & Service Co.*, Jackson, Miss., and the *Air Filter Sales & Service Co.*, Nashville, Tenn., have been appointed representatives in their respective areas for Far-Air products. *Marshall, Neil & Pauley, Inc.*, Texas and Louisiana representatives for Farr, have organized a subsidiary company in

(Continued on page 113)

(Continued from page 108)

New Orleans, the *Air Filter Company*, to handle Far-Air sales and certified filter service in the New Orleans territory. *St. Louis Air Filter Sales & Service Co.*, St. Louis; *Air Filter Sales & Service—Denver*, Denver; *Air Filter Sales & Service—Minnesota*, Minneapolis; and *Dust Control, Inc.*, Hawthorne, Cal., and San Diego, have also been appointed representatives of the Farr Company.

AMERICAN STEEL FOUNDRIES.—*Goff Smith* has been appointed manager, railway specialties, at Chicago.



Goff Smith

A. M. BYERS COMPANY.—*R. G. Angell* has been appointed manager of railroad sales at Philadelphia. Mr. Angell became



R. G. Angell

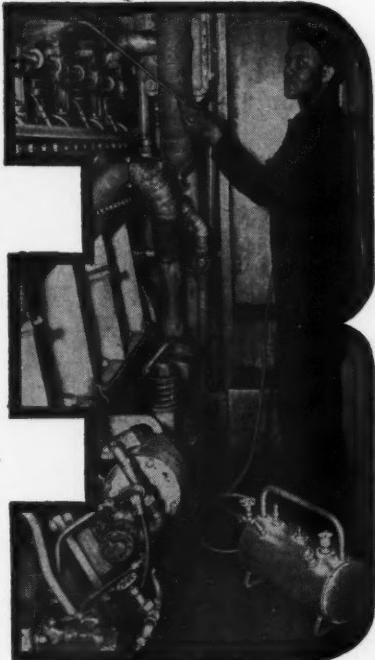
associated with Byers in 1934 and has been a field service engineer and railroad representative at Philadelphia and New York since 1935.

MAGNESIUM COMPANY OF AMERICA.—The *Brandon Equipment Company*, Chicago, has been appointed exclusive sales representative to the railroad industry for "Magcoa" dockboards.

THOMAS A. EDISON, INC., EDISON STORAGE BATTERY DIVISION.—Plans are being made for a 40 per cent increase in battery production capacity at the West Orange, N.J., plant at an estimated cost of \$6,000,000. This enlargement of plant will

## KEEP YOUR DIESEL ENGINE CLEANING

DOWN TO  
LESS THAN



MAN-HOURS  
PER UNIT!

Two men, in 1 to 1 ½ hours, will do a better cleaning job on a road unit than with time- and labor-wasting methods. The answer is Diesel Magnusol. Spray on...let soak...rinse off.

Write for details on safe, fast and thorough Diesel Magnusol, including many other uses, such as greasy concrete floors, engine pits, trucks and underbodies.



Railroad Division

**MAGNUS CHEMICAL CO., INC.**

77 South Avenue, Garwood, N. J.  
In Canada—Magnus Chemicals, Ltd., Montreal  
Representatives in All Principal Cities

**with**  
**Punch-Lok**  
**Hose Clamps**

You'll never know when or where—you're going to meet up with Punch-Lok. You'll find it clamping hose of all kinds on the railroads, the highways, the golf courses, and the "high seas"; in the mines, the shipyards, in construction, production, and the oil fields. You'll find it on duty with our armed forces in foreign lands . . . or mending and reinforcing fence posts on the farm. You'll think "Punch-Lok is everywhere" and—you'll be right.

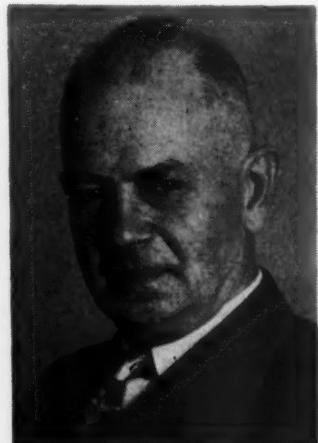
**PUNCH-LOK**  
*Company*

"The Sign  
of a  
Good  
Hose Clamp"

321 North Justine Street, Chicago 7, Illinois

be the second major expansion undertaken in four years to increase the company's manufacturing capacity for nickel-iron-alkaline storage batteries.

**BUFFALO BRAKE BEAM COMPANY.**—Charles R. Busch, formerly general sales manager, has been elected vice-president—



C. R. Busch

sales, and Bruce M. Jones, sales engineer for southeastern territory since 1941, has been appointed assistant to president. With



B. M. Jones

headquarters in New York, Mr. Jones will act as coordinator of the company's design and engineering services for railroads and car builders.

**NATIONAL BRAKE COMPANY.**—Emil P. Kondra, engineering and sales assistant, has been appointed assistant vice-president in charge of sales promotion.

**BALDWIN-LIMA-HAMILTON CORPORATION.**—W. T. Colman has been appointed district manager of the Washington, D. C., office. Mr. Colman was formerly in the sales department of Baldwin's Lima (Ohio) division. He succeeds J. R. Smith, who has been transferred to the Eddystone division at Philadelphia, where he will handle special assignments under direction of Robert G. Tabors, in charge of industrial products.

**BONNEY FORCE & TOOL WORKS.**—Roger O. Bay, formerly sales manager of the automotive division of Cleveland Pneumatic

Tool Company, has been appointed sales manager of the Tool division of Bonney Forge & Tool Works, Allentown, Pa.

UNION CARBIDE & CARBON CORP.—BAKELITE COMPANY.—*George C. Miller* has been appointed president of the Bakelite Company division. Mr. Miller succeeds *H. S. Bunn*, vice-president of Union Carbide, who succeeds the late *J. W. McLaughlin* as chairman of Bakelite.

OAKITE PRODUCTS, INC.—*H. Liggett Gray*, vice-president, has been elected second vice-president; *Frank L. Oldroyd*, general sales manager, industrial division, has been elected vice-president; *Eustace Lingle* and *Van Dorn C. Smith* have been named vice-presidents.

STANDARD RAILWAY EQUIPMENT MANUFACTURING COMPANY.—*W. E. Bikle*, assistant vice-president, has been appointed general manager at Chicago.



W. E. Bikle

GENERAL AMERICAN TRANSPORTATION CORPORATION.—*Edward D. Rollins* has been appointed western manager of the corporation's new Plate and Welding division sales office in San Francisco. *Richard H. Lamberton* has been appointed midwest manager of the division, with headquarters at Chicago. *Frank E. Seery* has been appointed district sales manager of the division, with headquarters at Pittsburgh, succeeding *Ben King Duffy*, resigned. Mr. Seery, who assisted Mr. Duffy in the Pittsburgh territory, will now be assisted by *J. A. Ross, Jr.*, who has been located in Washington, D. C.

AMERICAN CAR & FOUNDRY CO.—*M. Milo Millette* has been appointed works manager at the company's Buffalo plant. Mr. Millette has been acting head of the plant since February.

KELITE PRODUCTS, INC.—*Richard C. Martin*, in charge of the southern division at Dallas, Tex., has been appointed national sales director, with headquarters at Los Angeles.

GENERAL AMERICAN TRANSPORTATION CORPORATION.—*W. A. Mayfield*, formerly of Swift & Co., is now associated with General American as consultant, at Chicago.

GENERAL ELECTRIC COMPANY.—*E. S. Gunn* has been appointed manager transportation sales for the New England district of the Apparatus Sales division of General Electric Company, at Boston.

*G. E. Saunders* has been appointed manager transportation sales in the New York district, for the Apparatus Sales division at New York.

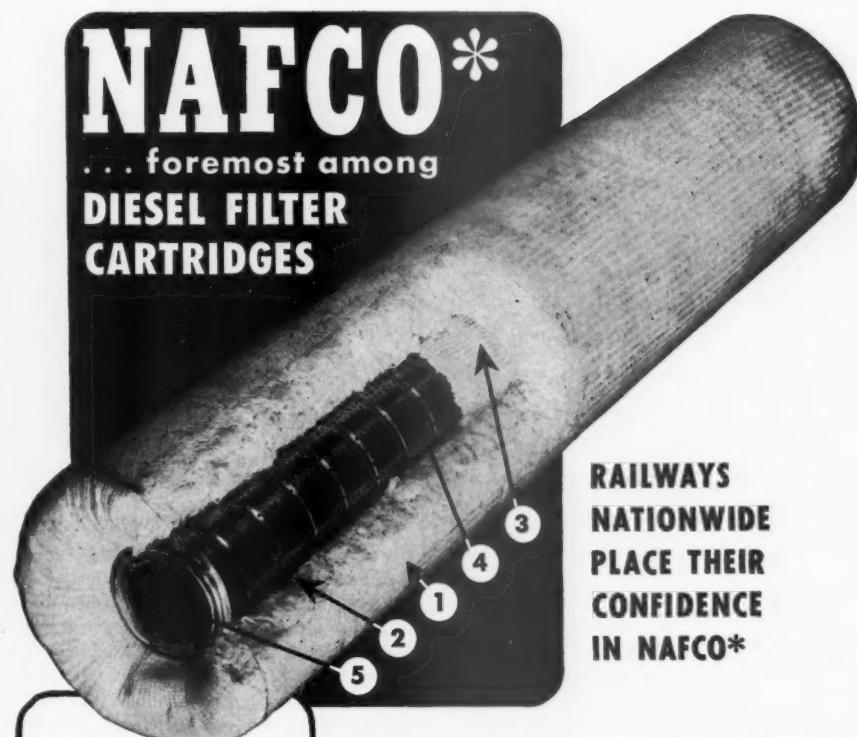
PERMACEL TAPE CORPORATION.—The name of the *Industrial Tape Corporation*, New Brunswick, N.J., has been changed to the Permacel Tape Corporation.

AUTOMOTIVE FINISHES, INC.—*Charles A. Skog*, formerly vice-president and general manager of the Grand Trunk Western-Canadian National, has been named railway sales representative of Automotive Finishes, Inc.

WESTINGHOUSE ELECTRIC CORPORATION.—Westinghouse has broken ground for a modern research center in Pittsburgh. The new facilities, which will ultimately replace present Westinghouse research laboratories, located since 1916 only a few miles away from the new site, are scheduled for completion early in 1955.

# NAFCO\*

... foremost among  
**DIESEL FILTER  
CARTRIDGES**



**RAILWAYS  
NATIONWIDE  
PLACE THEIR  
CONFIDENCE  
IN NAFCO\***

**Construction  
Features make  
the difference!**

1. Tough, fine mesh cotton outer covering guards against cartridge damage.
2. Cotton thread waste, machine-packed to even density, equalizes filtering.
3. Heavy fine mesh tubing covering center tube acts as additional filtering agent.
4. Strong, reinforced steel center tube with free flow perforations for maximum efficiency.
5. Two-way gasket seals out oil by seating and squeezing action. Oil can't by-pass.

**EXTRA PROTECTION AT NO EXTRA COST**

Nafco Oil Filter Cartridges are used in diesel engines on the nation's leading railroads. Every cartridge is of uniform size and design, easy to install and remove. Guaranteed to meet all R. R. specifications, Nafco Cartridges are made of quality materials for longer, more dependable service performance. Specify Nafco and be sure of the best.

\*Registered Trade-Mark of Nash Finch Co.

**FREE.** Send for bulletin giving complete facts and cartridge reference chart.

**REPRESENTED BY:**

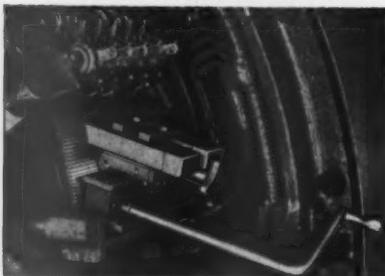
<b>GRANDY RY. EQUIP. CO.</b> 470 Union Commerce Bldg. Cleveland 14, Ohio TOwer 1-6500	<b>KIRK-WIKLUND &amp; CO.</b> 1706 Baltimore Ave. Kansas City 8, Mo. Baltimore 1700
<b>CARRIERS SUPPLY CO.</b> 818 Olive St. St. Louis 1, Mo. Chestnut 7016	<b>J. P. ARMSTRONG &amp; G. H. PROFITT</b> 215 Market St. San Francisco 5, Calif. Garfield 1-3498

**NASH FINCH CO.**

1752 Hennepin Ave., Minneapolis 3, Minn., Lincoln 7611

# MARTINDALE

## DIESEL-ELECTRIC COMMUTATOR MAINTENANCE EQUIPMENT COMMUTATOR GRINDER



New design makes resurfacing of Diesel-electric commutators more accurate, easier, faster. Carriage is chain-driven, travels on ball-bearings. Adapters for mounting grinder on virtually all models of Diesel generators and motors are also furnished.

### TYPE C COMMSTONE HOLDER



Holds Commstones rigid and true for concentric resurfacing of smaller Diesel-electric commutators such as auxiliary generators and amphyne exciters. Mounts on brush arm by means of an adjustable support.

### MICA-MILLER UNDERCUTTER



A powerful, light-weight, low cost, easy to use Undercutter, operating from 1/5 h.p. Universal motor. Available with small, medium or heavy-duty head (interchangeable). Also available with air motor or flexible shaft drive.

Send for new 64-page Catalog No. 29 of Maintenance, Production and Safety Equipment.

### MARTINDALE ELECTRIC CO.

1337 Hird Ave. Cleveland 7, Ohio

PENNSYLVANIA SALT MANUFACTURING COMPANY.—*L. C. Dobbrow and J. T. Miller* have been appointed railroad sales and service representatives of the Pennsylvania Salt Manufacturing Company.

### Obituaries

EDWARD PAYSON BULLARD, Jr., 80, chairman emeritus of the board of directors of the Bullard Company, died at his home in Fairfield, Conn., on June 26. Mr. Bullard became an apprentice machinist in the employ of the Bullard Company on March 10, 1892. He subsequently served as a draftsman, assistant superintendent, and general manager of the plant. Following the death in 1907 of his father, the founder



E. P. Bullard, Jr.

of the Bullard Company, he was elected president. Mr. Bullard was the recipient of the Howard N. Potts gold medal from the Franklin Institute of Pennsylvania for his development of the automatic machine, now known as the Multi-Au-Matic, and the A.S.M.E. medal for his leadership in the development of station-type machine tools. From 1911 until 1913 he was president of the National Machine Tool Builders Association.

FRANK E. ROSS, Sr., who retired as electrical engineer of the Terminal Railroad Association of St. Louis in 1952, died in May at St. Louis.

CHARLES H. CAINE, vice-president in charge of Midwest sales of the Cornell-Dubilier Electric Corporation, Plainfield, N.J., died in Chicago June 8.

R. P. CARLTON, president of the Minnesota Mining & Manufacturing Co., and a director of the Chicago, St. Paul, Minneapolis & Omaha since 1949, died June 17 at St. Paul.

ARTHUR J. SINGER, 86, vice-president of the Youngstown Steel Door Company, died at his home in New York June 21.

OTTO H. ANDERSON, president of the National Steel Car Corporation, Ltd., Hamilton, Ont., died suddenly on June 28.

JOHN F. RAPS, vice-president—sales of the Okadie Company and the Viloco Railway Equipment Company, both at Chicago, died June 8.

# PERSONAL MENTION

### Atchison, Topeka & Santa Fe

B. P. PHELPS, engineer shop extensions at Topeka, Kan., has retired.

P. I. ISAACSON, assistant engineer shop extensions at Topeka, Kan., appointed engineer shop extensions.

E. J. KELLY, supervisor of tools at Topeka, Kan., appointed assistant engineer shop extensions at Topeka.

### Bessemer & Lake Erie

PAUL S. WINTER, master car builder at Greenville, Pa., has retired after 50 years of service. Position of master car builder abolished.

ARNOLD MYERS, assistant master car builder, appointed superintendent car department at Greenville.

### Chesapeake & Ohio

J. A. COLLINS, car lubrication inspector, appointed general car inspector, Richmond and Clifton Forge divisions and Hinton proper, with headquarters at Richmond, Va.

J. H. STROUD appointed car lubrication inspector at Huntington, W. Va., appointed car lubrication inspector at Richmond, Va.

A. B. RAY, assistant car foreman at Handley, W. Va., appointed car lubrication inspector at Huntington, W. Va.

### Chicago & North Western

G. M. BRUERE, assistant director of research, appointed assistant to vice-president, operation, at Chicago.

### Chicago, Rock Island & Pacific

FRED J. SCHLEIHS, general superintendent motive power at Chicago, has retired.

MELVIN R. WILSON, master mechanic at Silvis, Ill., appointed general superintendent motive power at Chicago.

JOHN D. LOFTIS appointed assistant general superintendent of motive power at Chicago.

MARION C. SHARP, assistant general superintendent motive power at Chicago, appointed superintendent motive power at El Reno, Okla.

CLARENCE H. GRAY, superintendent motive power at El Reno, Okla., appointed master mechanic, Rock Island and Chicago divisions.

### Duluth, South Shore & Atlantic

Thomas F. Kearney appointed mechanical superintendent at Marquette, Mich.

Career: Employed as a machinist with the Great Northern, then as district service manager and as transportation sales

representative of the Chicago district office of Baldwin-Lima-Hamilton Corporation.

#### Minneapolis & St. Louis

W. W. LANDMESSER, diesel locomotive supervisor at Minneapolis, appointed superintendent of the mechanical department.

*Career:* Entered employ of M&StL in 1922 as a call boy at Oskaloosa, Iowa. Became roundhouse clerk in 1923; apprentice machinist in 1927; machinist at Minneapolis in 1936; supervisor of motorized equipment in 1943, and diesel supervisor in 1946.

J. B. McELWAIN, road foreman of engines at Minneapolis, appointed assistant superintendent, mechanical department.

A. R. KNICK, road foreman of engines at Marshalltown, Iowa, appointed assistant superintendent, mechanical department.

#### New York Central

##### EQUIPMENT DEPARTMENT Michigan Central District

N. F. McGUIRE, road foreman of engines of the Michigan Central, at Detroit, appointed chief road foreman of engines of entire Michigan Central district.

#### Norfolk & Western

A. R. SLUSHER, shop engineer at Roanoke, appointed to the newly created position of shop facility engineer.

#### Pennsylvania

J. P. FRANCIS, assistant superintendent, Chicago division, appointed superintendent motive power at Chicago.

W. S. PLUMMER, master mechanic, Cincinnati and Columbus divisions, appointed assistant superintendent at Chicago.

E. C. HANLY, master mechanic, Philadelphia division, transferred to Cincinnati and Columbus divisions.

J. M. CARPENTER, assistant master mechanic, Pittsburgh-Conemaugh divisions, appointed master mechanic, Southwestern division.

P. G. JAMISON, assistant master mechanic, Fort Wayne division, appointed master mechanic at Chicago.

J. K. SHERWOOD, assistant engineer motive power at Philadelphia, appointed assistant master mechanic, Fort Wayne division.

STEPHEN NAGY, foreman, Pittsburgh car yard, appointed general car inspector at Chicago.

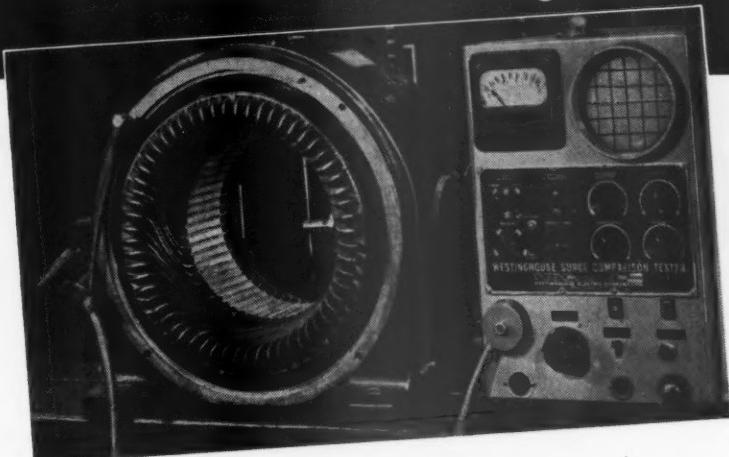
#### St. Louis-Southwestern

W. A. BRULE, JR., general locomotive foreman at Tyler, Tex., appointed master mechanic at Pine Bluff, Ark.

#### Southern

ROBERT C. SMITH, JR., appointed assistant foreman car repairs at Spencer, N.C.

## BETTER, FASTER, CHEAPER TESTING for insulation and winding faults



*Westinghouse Surge Comparison Tester* reduces production test time, permits positive results, fewer rejects—bringing substantial savings. This electronic device is designed to detect and locate insulation faults and winding dissymmetries in motors, generators, some types of transformers and coils. It operates quickly, simply, with fingertip control. Highly mobile and portable, it fits easily into production line techniques as well as repair shop. For more complete information, write Westinghouse Electric Corporation, I. E. Devices Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

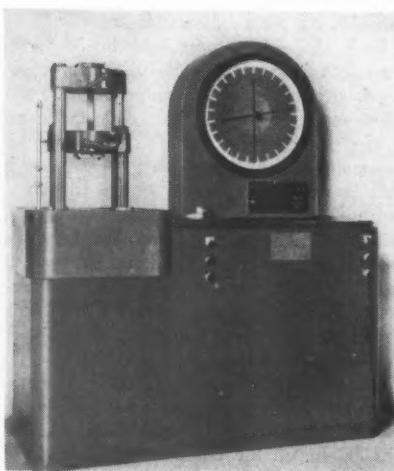
**YOU CAN BE SURE...IF IT'S**

**Westinghouse**

J-02257

#### New Devices

(Continued from page 102)



BENNIE T. CLEMENT appointed assistant foreman car repairs at Spencer, N.C.

JAMES H. DAWSON appointed assistant foreman freight-car repairs at Hayne car shop, Spartanburg, S.C.

RICHARD M. MORRISON appointed assistant foreman sheet metal shop, Hayne car shop, Spartanburg, S.C.

#### PERSONAL MENTION—Obituaries

R. D. BRYAN, who retired as mechanical assistant of the Atchison, Topeka & Santa Fe on January 1, 1952, died on April 2.

R. G. HENLEY, who retired on March 31 as general superintendent motive power of the Norfolk & Western, died on June 6. A sketch of Mr. Henley's career and his picture appeared in the May issue, page 117.

R. C. GOEBEL, superintendent of the mechanical department of the Minneapolis & St. Louis at Minneapolis, died on June 9.

*Career:* Became a draftsman in the employ of the M&StL in 1922; appointed assistant mechanical engineer in 1926; assistant to general master mechanic in 1935; general master mechanic in 1940, and mechanical superintendent in 1945.

LLOYD B. JONES, who retired as engineer of tests of the Pennsylvania at Altoona, Pa., in 1948, died on June 7.

#### Universal Testing Machine

New models of Baldwin 60-H and 12-H testing machines have been announced by Baldwin-Lima-Hamilton Corporation, Philadelphia 42. These units are of 60,000 lb. and 12,000 lb. capacity respectively.

Three changes are most conspicuous. First, clear space between columns has been increased from 10 to 15 in. Second, the device has been built as a single unit.

for QUICK, CLEAN, UNIFORM HEAT  
at LOW OPERATING COST—



## JOHNSTON SLOT-TYPE FORGING FURNACES

★ OIL OR GAS FIRED

★ SINGLE OR MULTIPLE SLOT TYPES

This furnace will maintain uniform neutral or reducing atmosphere for forging and welding which will avoid scale and decarburization. Construction features water, refractory or cast iron shields. Fire brick and insulating refractory brick lining with chrome refractory hearths are new features to reduce maintenance and operating costs and speed production.

★ BURNERS ★ BLOWERS ★ FURNACES ★ RIVET FORGES  
★ FIRE LIGHTERS ★ TIRE HEATERS, ETC.



# JOHNSTON

MANUFACTURING CO.  
2825 EAST HENNEPIN AVE.  
MINNEAPOLIS 13, MINN.

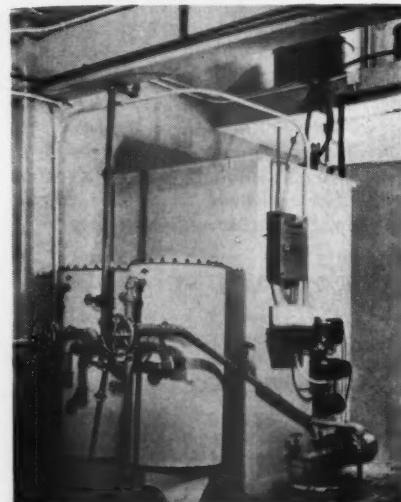
ENGINEERS & MANUFACTURERS OF INDUSTRIAL HEATING EQUIPMENT

Third, both machines are now available with either of two indicators: one with two Emery 16 in. dia. dials, and the other with Tate Emery Indicator, including three ranges on a single 24 in. dial.

Both models feature rigid loading systems consisting primarily of two cages. Load, either tension or compression, is applied upward by a movable cage made up of the table of the machine and two columns supporting the upper gripping head. This cage is attached to the piston in a hydraulic cylinder in the base of the machine and has a 6 in. stroke. Loading speed can be varied infinitely between 0 and 2 in. per min. on the 60-H and between 0 and 4 in. per min. on the 12-H. The lower gripping head is the upper member of the second cage.

Standard lower ranges, with Emery gage load indicators having 600 graduations, include 0-3000 lb. on the 12-H and 0-12,000 lb. on the 60-H. Ranges provided with the Tate Emery indicator include 0-2400 lb. and 0-1200 lb. on the 12-H and 4-12,000 lb. and 0-2400 lb. on the 60-H.

Both machines are 67½ in. wide and 27 in. deep overall and have a height of 77½ in. over the indicator.

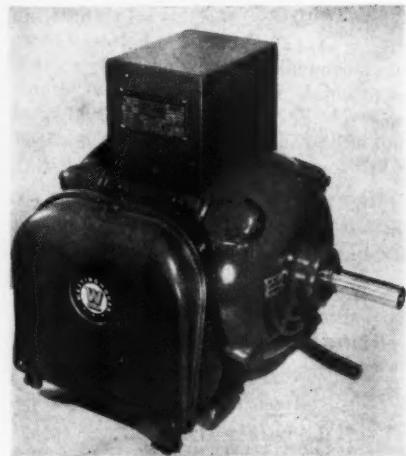


nounced by The Permutit Company, New York 36. The device consists of a Precipitator with built-in clearwell, a proportioning chemical feeder control, a coagulant feeder tank, a lime or soda ash and hypochlorite feeder tank, inlet float control valve, neutralite filter unit (s), Carbo-Dur purifier unit (s) and a service pump.

The manufacturer claims that the unit can be used to condition water for power stations, railroad terminals, boiler plants, etc.

Available in eight standard sizes ranging from 500 to 3300 gal. per min. and flows of 12,000 to 79,200 gal. per 24 hr., they may be used to remove turbidity,

color and organic matter from water supplies, to chlorinate, to remove tastes and odors, to remove iron and manganese, to neutralize, to soften and to de-alkalize.



### Capacitor Motor

A single-phase motor that is both capacitor-start and capacitor-run is available from the Westinghouse Electric Corporation, Pittsburgh, Pa. Called the type CAP-2, the motor is made in 5-, 7½-, and 10-hp. ratings, and is a 4-pole, 220-volt, 60-cycle motor.

Capacitor-run motors operate efficiently at near-unity power factor, and their design is such that starting current is reduced about 25 per cent, with the same high starting torque. The auxiliary winding remains in the circuit during operation and is in series with the running capacitors. Relays merely remove the starting capacitors when the motor approaches full speed. The main winding is directly across the line.

Elimination of the wound rotor, brushes, and commutator of the previous repulsion-induction design makes for a simpler motor with less maintenance. It also eliminates sparking, a cause of radio interference, and a possible fire hazard. Where three-phase power is not available, this new design will permit the use of larger single-phase motors.

### Valve Handwheel

A handwheel, designated as the Non-Slip, which features four finger-spaced lugs projecting from its stem hub through an octagonal frame has been introduced by The Lunkenerheimer Company, Cincinnati 14.

Designed to turn easily and safely, the handwheel will be incorporated on the manufacturer's line of bronze and iron valves, which formerly were equipped with regular malleable iron wheels.

Its design permits operators to apply a high pressure, even with wet or sticky hands, for tight closures, thus eliminating leakage, valve erosion, wire drawing and failure. The possibility of burned hands from contact with the valve stem is said to be eliminated due to the shape of the handwheel.

### Package Water Conditioner

A completely integrated and self-contained packaged water conditioner has been an-